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HISTORY OF ORGANIZATION

THE AMERICAN THERAPEUTIC SOCIETY was organized in the City of Washington, May 1, 1900. At the first meeting there were no scientific proceedings, all the sessions of the two days being devoted to the completion of the organization of the Society. The following officers were elected:—

President, Horatio C. Wood, M.D.
First Vice-President, Howard H. Barker, M.D.
Second Vice-President, Reynold Webb Wilcox, M.D.
Third Vice-President, Eli H. Long, M.D.
Secretary, Noble P. Barnes, M.D.
Recorder, William M. Sprigg, M.D.
Treasurer, John S. McLain, M.D.

The second annual meeting was held in Washington May 7, 8 and 9, 1901; the third at the Academy of Medicine, New York, May 13, 14 and 15, 1902, and the fourth in Washington, May 11, 12 and 13, 1903. At the fifth annual meeting, held at the Academy of Medicine, New York, June 2, 3 and 4, 1904, Dr. Oliver T. Osborne was elected President.

EX-PRESIDENTS.

Horatio C. Wood, Philadelphia. Elected May, 1900.
Reynold Webb Wilcox, New York. Elected May 9, 1901.
Thomas E. Satterthwaite, New York. Elected May 15, 1902.
Howard H. Barker, Washington. Elected May 13, 1903.

OFFICERS 1904-1905.

President, Oliver T. Osborne, New Haven, Conn.
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Second Vice-President, Carl Beck, New York, N. Y.
Third Vice-President, John V. Shoemaker, Philadelphia, Pa.
Secretary, Noble P. Barnes, Washington, D. C.
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Vice-Chairman, Howard H. Barker (1909), Washington, D. C.
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Francis P. Morgan, Washington, D. C.
Thomas L. Coley (1907), Philadelphia, Pa.
Egbert LeFevre (1907), New York, N. Y.
Newton M. Shaffer (1907), New York, N. Y.
Arthur A. Stevens (1908), Philadelphia, Pa.
Torald Sollmann (1908), Cleveland, Ohio.
John Blake White (1909), New York, N. Y.
Thomas E. Satterthwaite (1909), New York, N. Y.

BOARD OF CENSORS.

D. Olin Leech. Thomas E. Satterthwaite. Eli H. Long.

Next Meeting, Philadelphia, Pa., May 4, 5, 6, 1905.
John V. Shoemaker, Chairman Committee of Arrangements.

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June 15, 1904.

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Butler, George F., Chicago, Ill.
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Morris, Robert T., 58 W. 56th St., New York City.
Morton, William James, 19 E. 28th St., New York, N. Y.
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Pedersen, James, 20 E. 46th St., New York, N. Y.
Peterson, Frederick, 4 W. 50th St., New York City.
Pfaff, Franz, 871 Boylston St., Boston, Mass.
Phillips, Wendell C., 40 W. 47th St., New York City.
Pool, Benjamin G., 945 Rhode Island Ave., N. W., Washington, D. C.
Porter, P. Brynberg, 150 W. 84th St., New York, N. Y.
Porter, Wm. H., 1674 Broadway, New York, N. Y.

Reyburn, Robert, 714 13th St., N. W., Washington, D. C.
Robbins, Henry Alfred, 1750 M St., N. W., Washington, D. C.
Roosa, D. B. St. John, 20 E. 30th St., New York. N. Y.
Rottenberg, Ignatz M., 280 2d St., New York City.
Satterthwaite, Thomas E., 7 E. 80th St., New York, N. Y.
Shoemaker, J. V., 1519 Walnut St., Philadelphia, Pa.
Shoup, Jesse, 2d and Maryland Ave., N. E., Washington, D. C.
Sollmann, Torald, Cleveland, Ohio.
Spenzer, John George, 261 Amesburg Ave., Cleveland, Ohio.
Sprigg, Wm. M., The Rochambeau, Washington D. C.
Stewart, F. E., 67 Prospect St., East Orange, N. J.
Stevens, Arthur A., 314 16th St., Philadelphia, Pa.
Taylor, Henry Ling, 125 W. 58th St., New York, N. Y.
Thompson, Millard F., 474 Maryland Ave., S. W., Washington, D. C.
Van Rensselaer, Howard, 123 State St., Albany, N. Y.
Weber, Leonard, 25 W. 46th St., New York, N. Y.
White, John Blake, 1013 Madison Ave., New York, N. Y.
Wilcox, Reynold Webb, 679 Madison Ave., New York, N. Y.
Wiley, Harvey W., Department Agriculture, Washington, D. C.
Willard, DeForest, Philadelphia, Pa.
Work, Hubert, Pueblo, Col.

HONORARY MEMBERS.

Brunton, Sir Lauder, 10 Stratford Place, Cavendish Square, London, Eng.
Hayem, Georges, Paris, France.
Marshall, C. R., Dundee University, Dundee, Scotland.
Schoeler, Heinrich, 121 Wilhelms Ave., Wilmersdorf, near Berlin, Germany.
Tillmanns, Hermann, Leipsic, Germany.

DECEASED MEMBERS.

Samuel Claggett Busey, M.D., LL.D., born July 28, 1828, died Oct. 19, 1899.

William P. Manning, M.D., born Dec. 8, 1844, died Feb. 9, 1901.

John Thomas Winter, M.D., LL.D., born April 26, 1842, died June 22, 1902.

George Edward Tyler, M.D., born May 23, 1869, died July 7, 1902.

Robert Henderson Graham, M.D., born Jan. 29, 1849, died Aug. 24, 1903.

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OBITUARY OF JOHN THOMAS WINTER, M.D., LL.D.*

By Howard H. Barker, M.D.

Dr. John Thomas Winter, son of Thomas and Elizabeth (Fortney) Winter, grandson of Benjamin Winter, was born, April 26, 1842, at Petersville, Frederick Co., Maryland. He was educated at the academy of his native village. In the summer of 1861 he entered the Quartermaster's Department, U. S. A., and was stationed at Washington, D. C., during the greater part of the Civil War. In 1867 he began the study of medicine, taking a three years' course in the Medical Department of the Georgetown University, Washington, D. C., from which institution he was graduated March 11, 1870.

October 20, 1869, while still a medical student, he married Miss Alphonsa R. Hirst, daughter of the late Reverend William Hirst. His widow and four children survive him. * * *

During the thirty years of his professional life he was connected with many medical, scientific, benevolent and other organizations. He was a member of the Medical Society of the District of Columbia, and from 1889 to 1897 was one of the Censors. In 1891 he was Vice-President. He was also a member of the Medical Association of the District of Columbia, the American Medical Association, Washington Obstetrical and Gynecological Society and the National Geographic Society. He was a charter member and for two years president of the Washington Therapeutic Society, and a charter member and one of the standing committee of the American Therapeutic Society. He was also one of the Commissioners of Pharmacy of Washington, and President of that organization from March 13, 1894, until his death. He had long been connected with the Eastern Dispensary, first as one of the attending staff, and afterward, until his death, as a member of the

* Read May 11, 1903.

Consulting Board. He was Consulting Physician to the Methodist Home for Aged Women, and formerly one of the attending staff at Sibley Memorial Hospital. He was a member of the Committee on Public Health and the Committee on Universities of the Board of Trade. He was a 32d degree Mason and a member of several other fraternal organizations.

In the summer of 1884 he was invited by the Board of Regents of the National University to organize a Medical Department in connection with that institution. He accepted the invitation, and engaged at once in the work with such success that in October of the same year the school was opened with the following faculty: Drs. J. T. Winter, S. S. Adams, G. W. Cook, T. E. McArdle, G. W. West, Joseph Morrison, H. H. Barker. Dr. Winter was elected President of the school, which position he held until his death. From 1884 until 1892 he was Professor of Materia Medica and Therapeutics, and from 1892 until May, 1902, one month before his death, he was Professor of Theory and Practice of Medicine. In May, 1902, he was compelled, on account of the condition of his health, to resign this position, and he was thereupon elected Emeritus Professor of Theory and Practice.

Dr. Winter's contributions to medical literature include the following papers: "The Advance in Therapeutics during 1888-9," "Erysipelas," "Therapeutics of Puerperal Eclampsia," "Puerperal Peritonitis," "Jaundice during Pregnancy," "Extra-Uterine Pregnancy," "Croup," "Phlegmasia Dolens," "Absence of the Bladder," "How Shall We Feed the Baby?" "What is the Cause of Puerperal Fever?"

It has been my fortune to have known Dr. Winter from his youth until his death. I have seen him under almost all conditions of life—when a medical student, when a recently graduated doctor, poor and without patients; when a successful physician with a large and lucrative business, in difficult and dangerous cases, upon joyful and festive occasions in his home and elsewhere, and at the bedside of his dying child. At all times and on all occasions, in defeat and in success, in health and in sickness, in joy and in sorrow, he was always the same kind, gentle, loving, hopeful Christian.

For 18 years I was closely associated with him in school work. He felt great pride and took a deep interest in the institution, and labored hard in all his relations to the school and faculty to advance and elevate the institution and to secure for the students a thorough medical education. As a member of the faculty he displayed great business talent, and as a teacher he was most thorough and conscientious. His kindly interest in and encouraging, helpful manner toward the students endeared him to all of them. He was so thoroughly impressed with the sacredness of his responsibility to the school and the students that nothing but the most exacting professional engagements ever caused him to miss a lecture. In his attendance upon the school, as in his ministrations to his patients, no considerations of his own convenience or his state of health ever interfered with his efforts to thoroughly perform his duty. During the later years of his life he frequently left his bed when ill and delivered his lectures, sometimes scarcely able to speak on account of asthma.

As a physician he was kind and sympathetic. Always bright and cheerful, he carried sunlight into every sickroom he entered, and at once gained and always retained the love of his patients. It is well it was so, because for them he sacrificed his life. He was charitable, not only in that he gave his services freely and gratuitously to the poor, but in that he was lenient in his judgment of the wrong doings of others, and forgiving to those who injured him. Charitable in the highest sense of the word because he loved his fellow-man. He was conservative in that he was not hasty to make radical changes in remedies or methods, yet he was progressive. He examined new remedies and methods carefully and thoroughly, and when convinced of their utility, and not until then, he adopted the new and laid aside the old. He was a useful citizen, active in the causes of religion and temperance and all measures tending to promote the prosperity of the city, and the health and welfare of the community. He was an unobtrusive Christian. All who knew him felt that he was this, not because he said so, but because they learned it from his pure, consistent life.

PAPERS READ BEFORE THE SOCIETY.

ABEL, J. J.—The Teaching of Pharmacology and the Relation of the Subject to Practical Medicine (May, 1903).

ALLEN, C. W.—Recent Advances in Dermatological Therapeutics (May, 1902).

BARKER, H. H.—Obituary of Dr. J. T. Winter (*Washington Med. Annals*, 1903). Recent Advances in Medical Therapeutics (June, 1904).

BARNES, A. C.—A New Substitute for Silver Nitrate (*N. Y. Medical Record*, May 24, 1902).

BARNES, N. P.—Recent Advances in the Therapeutics of Pediatrics (*Medical News*, Oct. 10, 1903). Recent Advances in the Therapeutics of Pediatrics (*Medical News*, Sept. 10, 1904).

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FISHER E. D.—Recent Advances in Neurological Therapeutics (May, 1902).

FULLER, EUGENE.—The Present Status of Genito-Urinary Therapeutics (*N. Y. Med. Journal*, Dec. 13, 1902, p. 1026). A New Use for Thyroid Extract: A Cure, or at least, a Complete Control of Hemophilia through its Administration (*Medical News*, Feb. 28, 1903).

GANT, S. G.—Sterile Water Anesthesia (*Med. Record*, Oct. 29, 1904).

GARRIGUES, H. J.—Recent Advances in Gynecology (May, 1903).

GREEN, C. M.—Notes on Obstetrical Therapeutics (*Medical News*, Oct. 10, 1903).

HALL, A. J.—Caffeine in the Treatment of Alcoholic Toxemia (*Medical News*, Oct. 31, 1903). The Medical Treatment of Appendicitis (*Medical News*, Sept. 24, 1904).

HALL, J. N.—Report of Two Cases of Aneurism Treated by Wiring and Electrolysis (*Amer. Journal of the Med. Sciences*). Who May Benefit by Altitude Treatment? (*Medical News*, Nov. 21, 1903). Internal Antisepsis (*Medical News*, Oct. 8, 1904).

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JELLIFFE, S. E.—The Opium Habit and its Treatment (*Amer. Journal of the Med. Sciences*, May, 1903).

JEWETT, C.—Remarks Upon Some of the Recent Contributions to Obstetric Therapeutics (*Brooklyn Med. Journal*, Jan., 1903).

KERLEY, C. G.—Recent Advances in the Management of Diseases of Children (*Therapeutic Monthly*, June, 1902).

KIEPE, E. J.—Local Anesthesia (June, 1904).

KNIGHT, C. H.—Recent Advances in Laryngology (*Therapeutic Monthly*, June, 1902). Recent Advances in Laryngology (*Medical News*, Oct. 10, 1903). Advances in Laryngology and Rhinology (*Virginia Med. Semi-Monthly*, 1904).

KOLIPINSKI, L.—Therapeutics of Chromium Sulphate: Green Chromic Sulphate (*Therapeutic Monthly*, June, 1902). Therapeutics of Potassium Copaibate (*Medical News*, Sept. 12, 1903). Arthritis Deformans and its Treatment (*Medical News*, Sept. 3, 1904).

LEECH, D. O.—Dietetic Treatment of Pulmonary Tuberculosis (*American Medicine*, July 26, 1902).

LE FEVRE, E.—The Physical Treatment of Tuberculosis (May, 1902).

LONG, E. H.—Principles of Cardiac Therapeutics in Recent Valvular Disease (*Therapeutic Monthly*, June, 1901). The Capillary Area (*Therapeutic Monthly*, July, 1902). From Pharmacological Science to Therapeutic Art (*Medical News*, Oct. 10, 1903). The Need of Revising Our Ideas of Stimulation (*Therapeutic Review*, Aug., 1904).

MANN, M. D.—Recent Advances in Gynecological Therapeutics (*Phila. Med. Journal*, Nov. 8, 1902).

MORGAN, F. P.—Suggestions Concerning the Use of the Metric System in Prescription Writing (*American Medicine*, Nov. 23, 1901).

MORTON, W. J.—Recent Advances in Electro-Therapeutics (*Medical News*, Dec. 27, 1902, p. 1201). Local Anesthesia by Cataphoresis and by Pressure Anesthesia (June, 1904).

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PEDERSEN, J.—Recent Advances in Genito-Urinary Surgery (*Medical News*, Oct. 10, 1903). Recent Advances in Genito-Urinary Surgery (*The Post-Graduate*, Sept., 1904).

PORTER, W. H.—The Rational Basis for the Dietetic Treatment of Tuberculosis (*American Medicine*, Sept. 20, 1902).

REYBURN, R.—Address of Welcome. Inertness of Petroleum Compounds when Given Medicinally (*Medical News*, Aug. 24, 1901). The Causes, Prevention and Cure of Puerperal Eclampsia (*American Medicine*, Nov. 1, 1902, p. 706). The Rationale of the Cure of Morbid Growths by Photo-Theraphy and X-Rays (May, 1903).

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SATTERTHWAITE, T. E.—The Therapeutics of Subacute and Chronic Heart Disease (*Medical News*, Aug. 10, 1901). Address of Welcome (May, 1902). The Etiology and Diagnosis of Valvular Lesions of the Heart (*International Clinics*, 1903). Recent Advances in Medical Therapeutics (*Medical News*, Oct. 10, 1903). Some Considerations on Infection and Immunity (*Medical News*, June 4, 1904).

SHAFFER, N. M.—Recent Advances in Orthopedics (*Journal of American Medical Association*, Jan. 31, 1903).

SHOUP, J.—The Medical Treatment of Pulmonary Tuberculosis (*American Medicine*, Oct. 4, 1902). Treatment of Chronic Colitis (*American Medicine*, Aug. 27, 1904).

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SOLOMON, L. L.—The Therapeutic Value of Alcohol (*American Practitioner and News*, Nov. 1, 1901).

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TAYLOR, H. L.—Recent Advances in Orthopedic Surgery (*Medical News*, Oct. 10, 1903).

THOMPSON, M. F.—Recent Advances in General Anesthesia (June, 1904).

TYLER, G. E.—The Climatic Treatment of Tuberculosis (*Therapeutic Monthly*, June, 1902).

WEEKS, J. E.—Recent Advancement in the Therapeutics of the Eye (*Medical News*, Oct. 10, 1903).

WILCOX, R. W.—A Review of the Progress of Therapeutics for the Preceding Twelve Months (1901) (*American Medicine*, Vol. II., p. 93). A Review of the Progress of Therapeutics for the Preceding Twelve Months (1902) (*Medical News*, Vol. LXXX., p. 1064). The Teaching of Therapeutics (*Medical News*, Oct. 10, 1903). Recent Advances in Anesthesia (*Virginia Med. Semi-Monthly*, Dec. 23. 1904).

WILEY, H. W.—Control of the Purity and Standard Quality of Drugs (*Oil, Paint and Drug Reporter*, May 15, 1903).

WILLARD, DE F.—Gonorrheal Arthritis: Treatment by Early Irrigation of Joint (*Therapeutic Monthly*, July, 1902).

SCIENTIFIC PROCEEDINGS

1903 AND 1904.

FOURTH ANNUAL MEETING HELD IN WASHINGTON, May 11, 12 and 13, 1903.

Monday, May 11.

The Address of Welcome was by DR. R. REYBURN, President of the Therapeutic Society of the District of Columbia.

The Presidential Address on

RECENT ADVANCES IN MEDICAL THERAPEUTICS

was delivered by DR. T. E. SATTERTHWAITE, New York. Having remarked that therapeutics included the application of any method or agency which might ameliorate, cure or prevent disease, he said that, viewed from this broad standpoint, the most brilliant achievement of the science in recent years had been the practical suppression of yellow fever in Havana by the United States yellow fever commission. To emphasize the importance of this achievement he reviewed briefly the history of yellow fever in Cuba for the past 140 years prior to 1901, not a month of which elapsed, he said, without a yellow fever fatality in tse island. The work of the yellow fever commission began in 1900, when experiments with the mosquito theory were taken up. After eight months of anti-mosquito work the disease disappeared entirely from Havana, and for the fourteen months ending January last not a single new case had occured there. This had also been the record of the present year. Havana, with a population of 275,000, which had for ten years prior to American occupation an annual death-rate of forty-five persons to every thousand, has had this death-rate reduced to twenty-two per thousand, the record of the last full year of the American occupation of the

island. If such methods as these could be put into effect in Rio, Vera Cruz and other southern ports, yellow fever might be wiped out entirely.

The progress made in fighting the cholera epidemic in the Philippines was next referred to. This cholera came from China, and had affected, according to various estimates, from 120,000 persons to double that number. Freer and Marshall obtained good results from benzoyl-acetyl-peroxide as an intestinal antiseptic. The guaiacol carbonate and calomel treatment has also been used, and appears to have reduced the mortality one-half. Great credit in dealing with this disease, he said, was due to the American army of occupation. Only individual cases had occurred among our men, and stringent quarantine and other methods had been placed in force with splendid results.

Turning his attention to the plague, Dr. Satterthwaite declared that this dread scourge was now of practical interest to all Americans, since it had attacked our new possessions and also reached the shores of this country, so that grave epidemics within our borders were always possible. As in yellow fever and cholera, we have prosecuted the study of the disease with unremitting diligence, and equally as with them have had success. Rats, he said, were generally considered to be the chief medium for the spread of the disease, although it was held that fleas might carry it from one rat to another. Ants also might be the intermediate host, but not mosquitoes. The disease can enter the system by the air passages or by the digestive tract, but these avenues are rarely employed, and it is chiefly through abrasions on the extremities that the plague victim is infected. The bare legs and feet of the Filipino natives afford a convenient mode of ingress, while, if the well-shod and clothed persons contract it, it is through abrasions on the hands, arms or face. All nationalities are liable to contract the disease, but it is most fatal to the Chinese, and the San Francisco epidemic was in Chinatown. In commenting on the latter he said: "When we compare the way in which the plague was checked in the Philippines with the dilatory work in San Francisco we read an important lesson. From

June of 1900 until late in December of 1902 the plague prevailed continuously in San Francisco, the authorities using no proper means to control it, but when the United States government took the matter in hand the epidemic was brought under swift control. As to the Yersin-Roux serum treatment and Haffkinc's prophylactic, the former gave satisfaction, but the latter appeared to be of doubtful value."

The appointment of a medical member of the commission to supervise the construction of the interoceanic canal was urged as a necessary precaution on the part of this Government in undertaking the construction of the canal, for the purpose of handling the problems which will arise regarding epidemics of malignant malarial fevers. The most burning question now before the American physician at the present time, he said, was this one of tropical and semi-tropical diseases. Unless our colleges rise to the emergency, the Government will be compelled to found schools of tropical medicine. The recent discovery of uncinariasis in our Southern States shows what an intelligent study of these affections will accomplish. If progress means the saving of life, or the prevention of disease, can any record be more brilliant than the recent successes of our medical men in dealing with the yellow fever, cholera and the plague problems? For during the few years that we Americans have been recognized as a world power we have not only shown a degree of capacity for ruling alien races that has been unknown heretofore, but have devised methods for controlling some of their most terrible scourges in a way which indicates that we may eventually eradicate them entirely.

After referring to the terrible mortality from tuberculosis, Dr. Satterthwaite discussed the advantages and cost of sanitarium treatment. Statistics prove its superiority for suitable cases. The expense at Bedford, N. Y., was found to be only 76.8 cents per day tor each patient. Dr. MacDonald has treated patients in tent hospitals at even less expense. The method deserves further trial. A campaign of education is needed to teach the laity how to avoid consumption, and how to avoid giving it to others. Statistics show that we are already re-

ducing the mortality. The mortality from typhoid also has been reduced from 20 to 10 per cent. Abt, of Chicago, claims a mortality of only 5 per cent. in 40 cases in children, using benzoyl-acetyl-peroxide. Hirshfield uses hot baths, and claims a reduction in mortality of over one-half. The mortality from diphtheria has fallen 50 per cent. since the introduction of the anti-toxin treatment. In considering dosage, he stated that in one case the administration of 92,000 units was followed by recovery. In the treatment of cardiac affections the tendency is to use indirect rather than direct methods; hydrotherapy, exercise, diet, tonics and purgatives are assuming deserved prominence, while the nitrites are substituted as far as possible for digitalis and similar drugs. Many surgeons now admit that simple acute appendicitis is best treated by internal medication, the chronic and relapsing forms calling for surgical intervention. The paper concluded with a plea for a central supervision of the materia medica supply. Pharmacists are not sufficiently controlled by the sanitary authorities. If we are losing faith in the efficacy of drugs, it is largely because of the wide difference in the drugs of commerce as regards purity and strength. Methods have been devised for determining the precise medicinal value of drugs, and all medicinal substances, before being put up for sale, should be subjected to these tests.

SYMPOSIUM

THE TEACHING OF THERAPEUTICS.

DR. R. W. WILCOX, New York, in introducing the subject, said that the day had come when something more is demanded of the practitioner or physician-consultant than a diagnosis. A mere diagnosis is not sufficient; an anatomical diagnosis broad enough to constitute a basis for a sound therapeutic procedure is imperative, and upon this complete diagnosis an intelligent therapy must be constructed. It is not sufficient that we shall say a given method or remedy has been employed under these conditions; our obligation will not be satisfied until general principles have been fitted to the particular patient. The *what* may be the easiest determined; the *how much,* the when and *in what form* and *under what precautions,* must be fully stated.

What can be done for the patient and how best to do it is the goal toward which our best efforts should be directed. The question is, How shall we teach the medical student so that he shall be best fitted to become a useful practitioner? There is much room for improvement in our present methods. If post-graduate therapeutic instruction must needs be elementary at times, it is so from the necessities of those who demand it. When by conference of teachers a definite plan shall be adopted which shall bring the undergraduate to his doctorate as properly equipped for treating as he is now for recognizing disease, then the post-graduate teacher can assume that a solid foundation has been laid and a superstructure crowned by expert work, safely attempted. Then, and not until then, will our work be post-graduate in fact as well as in name. Not alone for ourselves are we now discussing this question, but doubtless what is said here will have an enormous influence upon teachers in schools not represented to-

day. Particularly, Dr. Wilcox would regard these topics as indicating causes of failure to obtain the best results in the past: (1) A practical acquaintance with various remedial physical measures and remedies, not less physiological, and methods of preparing the latter. This should be acquired during the early and mnemonic period of the student's career (recitation and demonstration). (2) Actual knowledge of the action of agencies and remedies acquired by personal experimentation and demonstration under the teacher's eye (laboratory demonstration). (3) Application of these agencies and remedies, the actuality of their effects for good or evil having been fixed in the student mind, in the treatment of diseases and symptoms, under proper supervision (lecture and clinical demonstration). (4) The accurate direction for the exhibition, in strict pharmacopeial nomenclature, of remedies and the scientific use of physical agencies must be so thoroughly comprehended by the student that he can not only intelligently apply them, but give valid reason for his treatment (clinical practice and conference).

THE TEACHING OF PHARMACOLOGY AND THE RELATION OF THE SUBJECT TO PRACTICAL MEDICINE.

Dr. J.J. Abel, Baltimore: The great value of laboratory experimentation is evidenced by the brilliant discoveries of the past, the promising investigation of the present, and the ever-increasing importance of laboratory methods in diagnosis. A knowledge of experimental details teaches conservatism; it makes the student hesitate to accept a current hypothesis as a general law of nature; it tends to arouse an appetite for the fundamental in medicine; it stimulates to inquiry and to a logical analysis of phenomena. At Johns Hopkins the course in Pharmacology is preceded by a study of the intoxications. Accompanying this is a chemical course dealing with the isolation of alkaloids, tests for poisons, blood, etc. There are also numerous recitations and conferences, but little didactic instruction. Pharmacology is taught by experiments and

demonstrations, the object being to illustrate the effects of the more important drugs. Such a course is valuable even if the student can perform only six or seven experiments himself. The teacher, while not necessarily an active practitioner, should be familiar with clinical work. Therapeutics, however, is best taught by the various clinicians. A course in Practical Therapeutics is desirable. Detailed instruction in Materia Medica is unnecessary. A brief course in Pharmacy is desirable, but not indispensable.

DISCUSSION.

DR. O. T. OSBORNE, New Haven, described the method used at the Yale Medical School. The course in Materia Medica is a short one, and is given in the last term of the second year, following the course in Physiology. It is preceded by a short course in Pharmacy. In addition each student must spend at least 50 hours in a pharmacy, between July 1 of the second year and January of the third. The Materia Medica course consists mainly in the demonstration of drugs to the men divided into small classes. For this purpose the drugs are classified according to their therapeutic uses, which is decidely superior to an alphabetical classification. Prescription writing is taught by practical blackboard exercises: the more the mistakes made, the more instructive to the students.

In the junior year the men take up Pharmacology, using Cushny as a text book. It is well to have in this Chair a man who is in touch with practical clinical medicine: the illustrations which he is able to give help the students to retain the facts presented to them. They are taught to study drugs in groups, according to their uses in certain conditions, the diseases and symptoms not being called necessarily by their technical names: they do not study each drug as a separate entity. As a rule, the students write better prescriptions early in their course than they do later. This is largely because they are at first taught the metric system, but later they come in contact with instructors and physicians who use the old system, and this brings about a certain degree of confusion. They are taught to memorize an average dose for each remedy rather than the limit of dosage. After the course in Materia Medica, the men are given a course in experimental toxicology. Therapeutics is introduced in the last part of the junior year. The student begins with the history of medicine, the object being to show that we do not know very much more than our predeces-

sors, after all. Having been brought down to this point he works upward, being taught the value of the different remedies in diseased conditions. Etiology, physiological action, pathology, sympathetic signs, treatment, etc., are studied in order. The men are cautioned against disturbing normal functions. These lectures are given in the therapeutic clinic. Record cards are carefully filled out for each patient, giving the temperature, pulse, history, diagnosis, probable cause of illness, prognosis, object of treatment, treatment, and finally results. Thus, when completed, the card contains a full history of the case, with the results of treatment stated in cold facts. The student learns much from such a thorough consideration of each case, not the least point being what remedies may be expected to accomplish.

DR. T. SOLLMANN, Cleveland, said that the particular method of teaching to be selected depends upon the object to be attained,—whether the student desires a scientific education, or one which fits him for active practice. The method must also differ according to the man in charge. After all, the subjects must be learned by the students themselves; the instructor can only make them as easy and interesting as possible. If this is done, the student usually does his full share. The first question is, How can the subjects be made interesting? By lectures, recitations, laboratory work, etc. If the student is allowed to chose his own text-book, the lecturer must discuss the subject in detail; but if, on the other hand the class is required to study a given text-book, the lectures can be shorter and more general in character. On some accounts it is not advisable to lecture too fully: the students take notes, and learn them, and can pass an examination upon them, and yet they may have no adequate idea of the subject from a broad point of view. The personal influence of the instructor upon the members of his class is a good one, and he is able to communicate some of his own interest to them. This is not true to such an extent in the quiz. Dr. Sollmann's aim was to give in the lectures a connected and brief summary of elementary facts before the student consults his text-book.

The greatest stress is laid upon the recitations. The object is to make the student think. Select one man, and stay with him until he understands the point. A general answer, or one given by rote, is not deemed satisfactory. Go around the class in this way. A student will often be able to correct his own mistake if he is adroitly led up to the truth without the direct impartation of the facts. The teaching of Pharmacology wholly in the laboratory is an impossibility, owing to lack of

time: hence we can only hope to illustrate the main principles in this way. The subject can be taught without a laboratory, but the task is a difficult one. The fact that a School has no pharmacological laboratory is therefore no reason why it should not provide a course in Pharmacology. Some laboratory work, however, is extremely desirable: it adds to the interest, and impresses facts more deeply upon the student's mind. It also trains him to deduce conclusions logically. In order to be of value, the work must be thoroughly done, and every point understood. Small classes are best. He has found it a satisfactory way to allow the best man in the preceding class to act as his assistant, demonstrating to sections of 6 to 12 students. As to the choice of experiments, the object is to illustrate methods, and in doing so to make the students familiar with as many drugs as possible. The men do blood experiments with a certain class of drugs one day: experiments upon the respiration, with another class of remedies, a second day, and so on.

The question as to whether a professor should also be engaged in general practice is an important one, and a difficult one to solve for all cases. Generally speaking, however, it is not advisable, as time is not sufficient to allow a man to engage in both pursuits to the best advantage. The subject of Pharmacology should be presented from an experimental and clinical standpoint. He agreed with Dr. Osborne as to the best method of teaching the subject from a clinical point of view. The classification of remedies according to their therapeutic effects is the most satisfactory. As regards Materia Medica, he agreed with Dr. Abel that, as other branches were of greater importance, only the most essential portions of the subject should receive attention. Of course it is essential that the student shall have a knowledge as to the physical properties of drugs, standards of purity, doses, etc. Concerning the advisability of teaching the metric system exclusively, opinions differ. The hospitals use the old system almost entirely. In his college the students are allowed a choice between the two systems. He believed that the metric is the system of the future, and thought the hospitals should also adopt it. The less Pharmacy taught the better. Five hours of demonstration and two hours of laboratory work weekly made up the course in his School.

DR. ABEL said that he agreed with Dr. Sollmann that Pharmocology cannot be taught exclusively by the experimental method: the experiments are merely an aid. Only 4 or 5 subjects of the major work can be demonstrated: each one requires

4 hours or more. He agreed with Dr. Osborne as to the classification of drugs: that based upon therapeutic effect was the most rational and satisfactory. We should be as purely scientific as possible in all matters pertaining to medicine. The study of Pharmacology gives rise to a desire for investigation: it develops an experimental mind, and the students of to-day are very liable to become the investigators of the future. Material success is relegated to the background, and a desire for scientific progress is brought to the front.

DR. E. H. LONG, Buffalo, read a paper entitled

FROM PHARMACOLOGICAL SCIENCE TO THERAPEUTIC ART.

Without fear of contradiction it may be asserted, he said, that the one chief purpose of the medical college course is to fit men to become practitioners. This granted, it follows that the highest object to be sought in the development of the capabilities of the individual student must be in the direction of his ability to prevent and remove disease. To the attainment of this object, the substance and method of study must be adapted throughout; and the complexity of the curriculum and diversity of methods of every well-equipped school of to-day gives evidence of progress toward its realization. The teaching of the first two years is better planned and better done than that of the last two years. Three reasons to support such belief may be given in passing: (1) The work of the earlier years is more definite in its character; (2) more teachers are giving their chief attention to teaching in these years; and (3) the student is doing more for himself in the various laboratories.

Discussing the third and fourth years of therapeutics separately, we find that the view-point from which to consider the work of the third year is that of a student well prepared in the fundamental sciences upon which medicine builds. Up to this time there has not been much to call forth his reasoning faculties; but from now on, if the interests of his future usefulness are best served, his training will include a large element of the developmental. He is prepared to associate facts, to recognize principles and to form conclusions. The question now

naturally follows, What shall constitute the third year course in therapeutics? The writer would answer, a careful development of the principles of treatment of all of the more important diseases, with a study in detail of the application to each, of the more important drugs. The ideal method is that which is the most natural,—the conference, or may we say the Socratic, method, where the students and teacher meet for discussion. The writer has employed this method with third year students for the past five years, with the most satisfactory results in the direction sought. Two hours per week are given to this conference course. The topic for a session is announced in advance. The discussion is given direction by questions asked by the teacher, but informality is invited. Any student is at liberty to ask a question or state an opinion at any time. Although a point is frequently thrown open to the class for discussion, or an appeal taken to the class for an opinion, usually not more than ten students have questions addressed to them individually during an hour. Marks are given to these, not only for facts known, but especially for ability to develop or reason out points in the discussion. During the second half of the year one clinical hour per week is added, with the same developmental object in view, and is conducted as far as is possible by the same method, the cardinal principle being observed that whatever the student can do himself should not be done for him. The courses in pathology and practice are correlated with that in therapeutics, being preferably a little in advance of it in point of time. In outlining the course, there is included a sufficiently extensive list of the principal diseases arranged by systems, e.g., the respiratory, the circulatory and the digestive systems, to secure the development of the general principles of treatment, and to gain an intimate knowledge of the application of the most important remedies. Emphasis is placed upon indications for, and contra-indications to, the use of each drug. The natural and hygienic methods of treatment are given first place. No attempt is made to discuss all drugs. Comparatively few new remedies are considered, the belief being that the time can best be given to the old well-known drugs.

What is the student expected to gain in such a course?

1. A self-acquired knowledge of principles of treatment.

2. The ability to weigh indications and contra-indications, and to reason out a rational plan of treatment for the case before him.

3. The relative importance of hygienic and medicinal treatment and of the various drugs employed.

4. A more intimate knowledge of the remedies of greatest importance, to the subordination of those of uncertain value.

5. An important mental training in the directions of his needs in actual practice.

Passing now from the third to the fourth year, let us approach the final year's work from a somewhat different point of view. The student is now a beginner in practical medicine, possessed of a wealth of facts, with a fair knowledge of their relations and a trained ability to use them in the study of cases. What shall his fourth year's work in therapeutics consist of? What does he most need? In finding an answer to these questions it will be helpful to consult the common deficiencies of the young practitioner in this special branch. Having referred to these in some detail, Dr. Long went on to say that a chief point in the fourth year should be to forestall such deficiencies. To this end two features should be given prominence: (1) The clinical sessions, whether in ward or lecture room, should include more of therapeutics. To ensure a proper balance, it is his custom to devote one hour per week, for at least one-half of the term, to clinical therapeutics, in which sufficient time is taken for a detailed discussion of the treatment of cases presented. (2) The training of the student's own efforts in all that pertains to practical treatment is of the greatest value to him. It is not what can be demonstrated to him in the matter of methods, for these are easily learned, but what will exercise his mind in independent discrimination and judgment, as to methods and means to be employed in given cases, that needs the greater emphasis. During the third year his thought has been engaged largely with classes of cases, and with the composite or typical case of the class; now he

studies individual cases in their variations. And his therapeutics of each case should be made just as special as the pathology. He must be led away from the idea of treatment of a class of diseases to the treatment of individual patients. He should learn that we can no more treat patients by classes than we can reform men by classes. Therefore, the emphasis must be continually upon the individual case. It is not necessary that all the instruction be clinical in the ordinary sense of the word. The presentation of good cases historically, or of hypothetical cases, furnishes a good basis for the study of variations in disease, and the application of principles of treatment. As a distinct feature of fourth year therapeutics, the writer has come to value what may be called the prescription conference. In this exercise four students take their places at the blackboard. Nos. 1 and 3 are given one case, and 2 and 4 another, each one to work independently. The cases given are either actual cases which they have seen in the clinic or hypothetical cases, and each student is required to outline treatment and write one or more prescriptions to suit his case. The balance of the class are encouraged, at the same time, to do similar work in their note-books, and to prepare criticisms of the work upon the board. In conclusion, the conviction was expressed that the developmental conference of the third year, and the practical prescription conference of the fourth, both supplemented by clinical therapeutics, will constitute a most important contribution to the development of the art of therapeutics upon a basis of pharmacology.

DISCUSSION.

DR. H. VAN RENSSELAER, Albany, described the method used in the Albany Medical College. For the first two years the instruction is largely didactic, in the third year it is didactic and laboratory, and in the fourth lectures are almost entirely eliminated. The physiological effects of drugs are illustrated by actual administration.

The class is divided into sections of not over eight men each. The students arrive at the hospital an hour before he does. Selecting one case, they study it thoroughly: two men take the history; another examines the urine; another the

fæces, sputum, etc.; another makes a blood count, etc. By the time he arrives the men have obtained a fair idea of the case, and he can proceed at once to the subject of therapy. This course is given in the third and fourth years. The class, under his direction, then gives the patient the treatment indicated; it may be massage, a cold bath, application of leeches, hypodermic medication, or an enema. Physical examination is taught in the preceding year. In the third year the men receive a thorough training in Hygiene, Physiology, Therapeutics, etc.

He could not endorse the card method described by Dr. Osborne, as the filling out of the card is a lengthy process, and such routine work does not teach students to think for themselves. The following are illustrations of class exercises: He first gives the patient some remedy which influences the stools, and asks the students why the passages are peculiar; or, a patient with an empty stomach is given a full therapeutic dose of digitalis, and the students note the physiological effects upon the pulse. Amyl nitrite and other drugs are used in the same way for purposes of observation. Drug therapeutics, local and general, are taken up next, several hours, perhaps, being devoted to a single patient. The result of this training is that the students gradually become prepared to treat patients outside. They are not "rattled" when they meet a patient. They have a good general idea of procedure, although they may not be able to make a scientifically correct diagnosis. It gives them self-reliance.

DR. OSBORNE said that he was not in favor of teaching, except to a limited extent, the therapeutics of disease according to groups or systems. Nevertheless students must be made to recognize that a serous membrane is a serous membrane wherever it is found, a mucous membrane a mucous membrane wherever it is; that a drug does not have a selective action, darting directly for the diseased spot and nowhere else. The symptoms exhibited by these membranes are always the same, plus those due to special location. The case-cards which he had mentioned were used only in the dispensary—not in the hospital. The number of patients treated is so great that such records are necessary to enable the student to keep track of the clinical features of individual cases on successive days.

Tuesday, May 12.

DR. Q. T. OSBORNE, New Haven, Conn., read a paper entitled

WHAT OUGHT WE TO EXPECT FROM CARDIAC DRUGS IN HEART WEAKNESS?

Having referred to the causes which in our modern life tend to produce all sorts and kinds of neuroses of the heart or debility of the heart muscle and to hasten that degeneration of the circulatory system that comes normally only late in life, he said that chronic cardiac weakness is due to chronic simple dilatation or to broken compensation in valvular disease, to myocarditis, to fatty degeneration of the heart muscle, and to general or local arteriosclerosis. Besides these positive disorders we have all sorts and kinds of neurotic disturbances giving both acute and chronic symptoms. It is unnecessary to even mention the symptoms and signs of any of these various cardiac upsets, but the successful treatment of any of them depends upon the proper understanding of the pathology of the case, and this pathology can only be made positive by a correct diagnosis of the condition. Many cases, however, require not only careful immediate study and discrimination, but even prolonged observation to positively decide the difference between an organic lesion and a neurotic irritation, and until the pathology of the case is understood the treatment will often be unsuccessful and perhaps absolutely wrong.

The writer believed that if we have some of our old well-worn tools sharpened, we may the better mold the flagging heart into a normal condition. Our tools in this case are the cardiac tonics and stimulants, and perhaps a little sharpening may make these tools the more ready for us. In speaking of the medicinal treatment of cardiac weakness, however, he by no means intended to minimize or belittle the all-important

matter of general treatment. Drugs which increase the strength of the cardiac systole or which increase arterial tension increase the blood pressure in the aorta and consequently increase the activity of the circulation in the coronary arteries, and improve the nutrition of the heart muscle. Hence only such drugs as meet these requirements can be cardiac tonics. He would describe a cardiac tonic as a drug that will more or less permanently strengthen the heart and pulse, and leave the heart in better condition after its action has ceased than it was in before. A cardiac stimulant, on the other hand, is a drug which will stimulate and perhaps for a short time strengthen a weak heart, but when its action has ceased the heart is left really in poorer condition than before, unless the cause of the weakness for which it was given has ceased to act. In other words, it irritates the heart to better work, but at the expense of its reserve energy. Some drugs partake of both of these properties, being both quickly stimulant and leaving some permanent increased strength of the heart. Most cardiac tonics act slowly and cause the best results only after a more or less prolonged use. To meet the condition of shock or heart failure, or any sudden cardiac weakness, those drugs which are quickly stimulant to the heart and vasomotor system are indicated. It is a question of momentary emergency and not a question of cardiac nutrition, hence acute cardiac weakness calls for a cardiac stimulant, while chronic cardiac weakness calls for a cardiac tonic.

The queen and peer of all cardiac tonics is digitalis. Having referred to its action, he said that the conditions improved by this drug are those of chronic cardiac weakness from any cause except when due to myocarditis or to fatty degeneration, or, more definitely, digitalis should be used in broken compensation in valvular disease, in simple dilitation, in the irritable or weak heart of nicotine poisoning, in strained heart from overwork, overathletic exercise, severe marching, mountain climbing, etc.; also where there is poor vasomotor tone, and where there is edema or exudations with no serious kidney lesions. The action of digitalis in slowing the heart by its action on the pneumogastric nerve gives the heart a much-

needed rest, and the action on the cardiac muscle making the contractions more effective and more complete, thus acts as regulated calisthenic exercise, and the cardiac muscle is increased in thickness and strength. The greater force with which the blood is expelled through the aortic orifice plus the contraction of the blood-vessels so raises the blood-pressure in the aorta that the circulation through the coronary arteries is increased and the nutrition of the heart is improved. The abnormal valvular conditions without adequate compensation that digitalis would most benefit are those in which slowing of the heart would be of value and those in which hypertrophy of the left ventricle would be of value, digitalis acting with the greatest force upon the part of the heart that has the greatest amount of muscle tissue, namely, the left ventricle. As far as the lesion goes digitalis is of greatest benefit in mitral insufficiency, next in mitral stenosis, next in aortic insufficiency, and next in aortic stenosis. The greatest amount of benefit from slowing the heart is seen in mitral stenosis, while in aortic regurgitation a prolonged diastole due to much slowing of the heart would be a disadvantage, while in aortic stenosis the strong left ventricle contracting against a great resistance should cause digitalis to be used with care. The satisfactory action of this drug when compensation is weakened in valvular disease may be many times repeated, but sooner or later many cases of severe valvular lesion with recurring incompetency the cardiac muscle becomes so deteriorated that digitalis is no longer able to restore the hypertrophy. Some patients do well with small doses of digitalis long continued for months and even years, other patients with valvular disease and incompetency after the hypertrophy has been restored by digitalis may not again need a cardiac tonic for months until some unusual exercise or mental anxiety or severe sickness has again broken the compensation, and again digitalis will improve the condition. Often, however, in cases that have repeatedly taken digitalis, or in some patients always, one of the other cardiac tonics will serve us better than will digitalis.

In any condition in which the right side of the heart is dilated and incompetent without valvular lesions, as occurs in

pulmonary disturbances such as pleurisy, empyema, advanced tuberculosis, and especially emphysema, digitalis is of benefit. In conditions of sudden cardiac failure or shock from any cause the action of digitalis is so slow, even if given hypodermatically, that it should not be relied upon to meet the emergency. If the shock or cardiac distress can be overcome for the time being by other drugs, digitalis given at the time will in some hours begin to add its powerful stimulation to the heart and blood vessels. In acute endocarditis occurring as a complication in acute rheumatism, if the heart is beating at the rate of 110 beats per minute it would seem good treatment to cause such physiological rest as would be produced by reducing the pulse rate to 80 or 90 beats per minute, or about 30,000 beats less in twenty-four hours, and this by a drug that will not weaken the heart.

In the feeble heart of myocarditis and of fatty degeneration the utility of digitalis is much less prononuced, and the advisability of using it at all has been questioned. However, in many of these cases if the drug is given cautiously in small doses it will prove of considerable benefit, as many times we are not certain that there is actual degeneration of the cardiac muscle, and also it is impossible to decide how extensive the degeneration is even if we assume that it actually exists. Digitalis should not be used in endarteritis or atheroma and hence ordinarily not in aneurism. In the insomnia of neurasthenics or where there is general vasomotor debility, when the patient is drowsy when up and wakeful when he lies down, the tone of the blood-vessels being so poor that the blood tends to gravitate to the lowest part of the body, digitalis acts often as a good soporific. In fact, in neurasthenic conditions or conditions of vasomotor ataxia digitalis is a general tonic to the whole system, improving the general circulation and increasing the general nutrition. In delirium tremens whatever cardiac treatment is given should be given hypodermatically, as drugs administered by the stomach are either not absorbed at all or are absorbed very slowly, which accounts for the harmlessness of the enormous doses of digitalis given by the mouth in this condition. When there edema of the lower

extremities from anemia, and where there are effusions without kidney lesions, and when there is chronic liver disease, digitalis combined with other proper treatment is always of benefit.

As to the use of digitalis in renal inflammation, the writer was of the opinion that no fixed rule can be given. If it does not give good results in thirty-six, or at least forty-eight hours, it should be stopped. If the results are good, the size of the dose should be diminished, as overaction from digitalis can certainly readily take place in kidney lesions.

The contra-indications to the use of this drug are a high tension of the arteries, atheroma, a weak cardiac muscle from prolonged fevers or from fatty degeneration, myocarditis, and ordinarily a serious kidney lesion. Inflammation of the stomach or even severe dyspepsia should cause some other cardiac drug to be substituted.

The best substitute for digitalis is strophanthus, which he was accustomed to describe epigrammatically as "acting just like digitalis, only less so." The indications for preferring and using strophanthus in place of digitalis might be stated as: (1) When there is need of a cardiac tonic and digitalis produces nausea, vomiting, and too great an increase of the blood pressure; (2) when a cardiac tonic is indicated and the blood pressure is already high; (3) when a rapidly acting cardiac tonic is desired; (4) when there is more nervous irritability and weakening of the heart than actual muscular debility or incompetency; (5) children are very susceptible to the action of digitalis, and hence strophanthus is many times a better drug for them when a cardiac tonic is indicated.

To briefly characterize the less important cardiac tonics, we may say that a therapeutic dose of sparteine sulphate should slightly slow the heart, regulate its rhythm, prevent its nervous irritability, slightly diminish the pulse tension and moderately increase the output of urine. This drug is not a substitute for digitalis. The indications for its use are irregularity and nervous irritability of the heart, especially when conjoined with general nervousness.

In regard to cactus, his observations, when a fresh active

preparation of the fluid extract has been used, have shown that it would regulate the heart, quiet its nervous irritability, and render large doses or the constant use of strong cardiac tonics often unnecessary. This drug does not cause increased cardiac muscular strength as does digitalis. It is, however, of value in having no cumulative action, in seeming not to wear itself out, and to have good action after compensation has been reëstablished by digitalis in valvular disease and still some cardiac tonic must be given to keep the compensation intact. When the heart is weak in convalescence from acute disease and digitalis is not a good drug to use, cactus is beneficial. The same is true in the debilitated heart of old age, when digitalis is contra-indicated on acount of its so markedly raising the blood-pressure. In functional disturbances of the heart, as arhythmia, palpitation, or tobacco heart this drug is of value.

Convallaria and adonidin have proved unsatisfactory drugs. Barium chloride, though a drug not much used, has a powerful stimulant effect on the heart muscle, and causes the blood-vessels to contract. It acts quickly, and should perhaps be resorted to more frequently than it has been. The action of suprarenal is now so well understood that it need not be more than mentioned except to emphasize the fact that it acts as a vasomotor and cardiac stimulant only when absorbed from the nose or mouth, and not after it has been swallowed into the stomach.

Of the two stimulant cardiac tonics, strychnine and caffeine, the former is so much and so well used as to only require the caution that we do not inaugurate its good work too soon in acute disease, but should rather reserve it for the coming emergency. Also, as a general bracer in debilitated conditions or in conditions requiring tonics it is used too frequently and too much.

Caffeine quickens the heart, increases the tone of the blood-vessels, increases the rate of respiration, stimulates the cerebral functions, increases muscle tone and power, diminishes fatigue, increases the output of urine, especially the watery element, and hence raises the specific gravity of the blood,

which will then get more water where it can find it. The indications for the use of this drug are (1) as a cardiac stimulant; (2) as a cerebral stimulant; (3) as a muscle stimulant; (4) as a diuretic; (5) as an antidote in poisoning.

As a cardiac stimulant caffeine may be used at any time when such a stimulant is indicated. It acts quickly to tide over a period of cardiac depression, but is not as quick in its action in urine collapse as the reflex stimulation of a strong alcoholic preparation or the stimulation of ammonia. It is, however, a strong adjunct to the above, and with strychnine makes an active respiratory and cardiac stimulant with no secondary depression, and leaves the heart better than it found it.

As a cerebral stimulant, perhaps no drug equals caffeine, not only in cases unused to its action, but in those accustomed to its use. While we cannot say that there is a true coffee or tea habit, i. e., an intolerable and uncontrollable desire for caffeine, still at the regular hours for coffee and tea stimulation, if it is omitted, the majority of patients miss greatly its effects. The hard brain-worker at irregular hours, as editors, reporters, authors, and students just before examinations, increase the number of hours in which the brain will work well by frequent cups of coffee, learning that it is the best and most effectual stimulation that they can take and leads to no immediate secondary depression. As the coffee wakes up the brain, so to speak, it also stirs up the spinal cord and peripheral reflexes. The man after this cerebral stimulation then smokes a good deal, which soothes the spinal irritation, and he then, having coffee plus tobacco, can do an immense amount of brain work. If this is kept up long, sooner or later, depending upon the individual endurance, a nervous, irritable condition supervenes, with insomnia, anorexia, loss of weight, tremulous tongue, perhaps some trembling of the hands, with a pale or yellowish skin due to disturbed liver function, and perhaps some kidney or bladder irritability, with probably a nicotine heart. We have then a neurasthenic to treat, which means to stop all coffee, tea and tobacco, give mental rest, change of air and scene, and the institution of

every legitimate means or subterfuge to produce sleep. The contra-indications to the use of caffeine are palpitation, irritable heart, high blood pressure, cerebral or spinal inflammations or irritations, insomnia, neurasthenia, and acute genito-urinary inflammations.

There is a considerable difference of opinion to-day as to the value of alcohol as a cardiac stimulant. Its action on the vascular system, however, is marked and positive. The irritation which strong alcohol in any form causes on the mucous membrane of the throat, esophagus and stomach acts reflexly through the medulla to cause vasoconstriction, and hence a rise of blood-pressure, and increased blood-pressure is always a stimulant to the heart. After alcohol is absorbed into the blood, where it circulates as alcohol, it cannot, in the writer's opinion, by its physiological action on the vasomotor centers, on the blood-vessels, and the heart, ever be a stimulant, although as its secondary effect is to dilate the blood-paths, this very fact of increasing the peripheral circulation may better the condition of the heart. The exact action of alcohol on the heart itself is not proved beyond a reasonable doubt. Certain it is that overdoses of alcohol after absorption are depressant to the heart muscle, to the muscle fibers of the blood-vessel walls, and to the vasomotor center in the medulla. In sudden cardiac failure the reviving action of alcohol seems to be due entirely to the reflex stimulation of the mucous membrane of the throat and stomach. By this stimulation we cause an increased cardiac frequency and a slightly raised blood-pressure from the contraction of the arterioles due to the reflex action on the medulla. This action, which occurs before much alcohol has been absorbed, may tide over the condition of acute cardiac failure, and if not much alcohol has ben given, there will be no future cardiac or vascular depression. If too much alcohol has been administered and absorbed, the result will be to increase the previous depression unless more fresh alcohol is given for its continued stimulant reflex effect. If the previous doses are not too large and are hence rapidly burned or eliminated, the effect will be continued stimulation and not depression. In

conditions of high temperature where the heart is very rapid from the stimulation of the fever, from the irritation of the toxins in the blood and from nervous irritability, alcohol, by quieting the nervous system, dilating the peripheral blood-vessels, and possibly combating the toxins in the blood, generally reduces the temperature and slows the pulse. If the dose is properly regulated this action will be found to be continuous for good. Too large doses or too frequent administration of alcohol may do one of two things; either stimulate the brain and cause more excitation, increasing the temperature by increasing the muscular irritability and restlessness, and causing enough of its local reflex irritation to make the pulse bounding and full; or, if it is too rapidly absorbed, it will give the symptoms of alcoholic depression on the circulatory system. Hence in acute cardiac failure, to get the stimulant effect of alcohol it must be given concentrated, as exemplified by brandy, whisky, gin, run and champagne, and in small doses. To keep up this stimulation, another dose must be given in from fifteen minutes to half an hour, depending upon the continuousness of the heart weakness, in order to repeat the stimulation of the irritation. As just stated, the dose should undoubtedly be small, as the future depression from the absorption would be less than it would from large doses. If the frequency of the dose is such that alcohol piles up in the system and more is given before the previous ingested amount has been burned or eliminated, to obtain stimulation it will be necessary to give larger and larger doses, first to overcome the depression caused by the previous alcohol, and to also cause the usual stimulation. As more and more alcohol is absorbed, whether from the stomach or from hypodermatic injection, depression, vasomotor dilatation, cardiac weakness, and more or less paralysis of the nervous system are sure to follow. Hence to combat continuous or persistent cardiac failure or depression alcohol is the poorest stimulant we can use, and if much is given we are poisoning the system and adding depression to depression that is already there, and the treatment is vicious.

In conditions of prolonged fever where alcohol is given

no more frequently for any length of time than every three hours, one dose is probably eliminated or burned before the next one is given, and we get the primary stimulation plus the dilatation of the peripheral vessels, which equalizes the circulation and reduces the temperature. The writer has often obtained the same good circulatory results in sthenic fever from small doses of nitroglycerin that he has with alcohol. In serious feverish conditions undoubtedly the narcotic effect of alcohol in quieting the patient who is highly alert to his danger, may be of distinct advantage, as mental worry and anxiety are great disturbers of the heart and circulation, and should be overcome by any legitimate means.

DISCUSSION.

DR. E. H. LONG, Buffalo, said that the first effect of digitalis, the direct effect upon the heart, is the most desirable; the slowing comes later, and may or may not be desirable. He liked the terms "kinetic" and "potential" as applied to heart stimulants—digitalis and caffeine are kinetic stimulants; strychnine, which acts by irritation of tissue, is a potential stimulant.

DR. R. REYBURN, Washington, advocated smaller doses of digitalis, strychnine and alcohol. Strychnine is now given for almost everything. He had seen a case in which it caused cerebral hemorrhage by raising arterial pressure. It is often well to combine digitalis and aconite, and aconite alone is frequently of service.

DR. T. E. SATTERTHWAITE, New York, spoke of the importance of arteriosclerosis, ascribed the increasing frequency of diseases of the heart and arteries largely to syphilis, gout, the "strenuous life," abuse of alcohol, tobacco, coal-tar products, etc. The nitrites are often preferable to digitalis. In determining treatment it is necessary to distinguish between functional and organic cardiac affections, and also between cardiac stimulants and tonics. Serious mistakes have resulted from a failure to observe the first precaution. In functional derangements digitalis often does harm, but the antispasmodics do good. A slow or a fast pulse in heart affections has little significance. In his experience suprarenal extract has acted well as a heart tonic when given by the mouth. He usually prohibits tea, coffee, and tobacco. Coffee is a poison to about one-third.

DR. A. T. HALL, Washington, commended caffeine as a valuable heart tonic.

DR. OSBORNE, in closing, spoke of the connection between the declining function of the thyroid gland, which begins at about the forty-fifth year, and arteriosclerosis. Thyroid extract, in small doses, tends to minimize the changes resulting from atrophy of the gland, and also the symptoms dependent upon them. Gout and gouty asthma may often be prevented in this way.

DR. R. REYBURN, Washington, read a paper on

THE RATIONALE OF THE CURE OF MORBID GROWTHS BY PHOTO-THERAPY AND X-RAYS.

After some discussion of the question, What are the X-rays? he expressed his concurrence in the belief that they are the rays from the invisible end of the spectrum (beyond the violet), which are broken up and rendered visible by the electrical current. Blondelot has recently adduced evidence going far to prove that the Roentgen rays are susceptible of polarization, and can therefore be traced in the spectrum. If this be true, and the rays are transversal, as Blondelot thinks, it follows that they are a species of ordinary light, but of extremely short wave-length, perhaps one hundred times shorter than the waves of the light which one can see. Dr. Reyburn then went on to say that the experience of all who use the Finsen ray, or rays from the violet end of the spectrum, and the X-rays for the cure of pathological growths is gradually leading to the conclusion that only superficial growths are amenable to their remedial powers. The deeper morbid growths, profoundly buried in the tissues, are but little benefited by them. He expressed the opinion that the destructive action upon morbid growths of the Finsen light and of the X-rays is the same, the difference between them being one of degree. The Finsen light is much weaker than the X-rays, and cases of lupus and epithelium that are cured by comparatively few applications of the X-rays require much longer treatment when treated by the Finsen method. He believed also that the X-rays destroy the tumors

of lupus and epitheloma simply by their escharotic effect upon the growth. The continued application not only destroys the growth, but forms a zone or layer of lymph around the part, which protects the body from further infection from the morbid cells of the growth. In a previous article, written in 1902 and entitled "Failure of the Knife in the Cure of Cancer," the writer had stated that in his opinion the reason why the use of the knife fails in the cure of cancer is the fact that during such operations the veins and lymphatic channels are cut directly across, and hence are laid wide open for infection. As is well known, the diseased cells are generally infiltrated into the tissues of the part far beyond the apparent limits of the tumor, and thus by our operations we often extend and increase, instead of destroying, the morbid growths. His general conclusion was that the Finsen and X-rays act on tumors just as other caustics do, but are greatly superior to them in that they do not produce such destructive waste of tissue, and hence leave far less deformity of the parts after healing has taken place.

DISCUSSION.

DR. W. J. MORTON, New York, said that the explanation of the nature of X-rays which Dr. Reyburn had advanced is the one generally accepted: they are caused by wave lengths in the actinic field. It is unfortunate that we do not as yet know the length of the vibrations, nor can we differentiate rays of particular wave lengths, although the use of the soft and hard tubes is an attempt to do this. The light is a mingling of a great variety of wave-lengths and it would be a great advantage if it were possible to differentiate the rays. Stokes, of England, says the X-ray as now used in the Crookes tube is a confused mingling of vibrations of different lengths comparable more to noise than to music. Dr. Morton agreed with Dr. Reyburn in his estimation of the Finsen light. Roentgen rays, he said, are so much superior that we can dispense with the cumbersome Finsen apparatus. He would go farther than Dr. Reyburn; believing that not only superficial cancer but also the deeper forms are benefited by X-rays, althought not to so great an extent. All are agreed that superficial growths, like squamous epitheliomata, can be cured in 100 per cent. of cases; but this is not true of the deeply extending and eroded forms. All of them are not amenable to treat-

ment. We do not know how the rays produce their beneficial effect. He did not believe, however, that it is due to any caustic action; their action is not at all like that of caustics, potassa for instance. Many think the rays act as a stimulus to the protoplasm of the cells, causing a reaction which results in their protection. He believed that this is of the nature of a leucocytosis, rather than the formation of a "protective wall," as suggested by Dr. Reyburn.

It is a mistake to say that only superficial cancer is amenable to the rays. He has cured all of 12 cases of early primary cancer of the breast, and the report will soon appear in print. There will probably be a flood of protest against his views, but he is ready to stand by them. He believes that the patients are cured, and that his diagnosis was correct. The results of operation are certainly not encouraging: the Heidenheimer operation, the best for cancer of the breast, gives only 25 per cent. of cures. Ninety-five per cent. of sarcomata of the breast are said to recur. If treated early, morbid growths, like other growths, show a weakness to attack. The younger a growth, the more amenable it is to the rays. He wished to go on record as saying that he proposes to treat every case of cancer with X-rays until he finds that his patient is losing ground. This does not happen unless the case is inoperable and beyond saving by any known means. A large proportion of cases of incipient sarcoma and carcinoma should be treated by X-rays before resorting to the knife, and the treatment should be kept up long enough to produce a definite result. He spoke as a conscientious operator, and would utterly condemn the attempts of quacks throughout the country to cure cancer. The fact that there are some of this class among those who treat malignant growths by X-rays is no argument against those who use the rays conscientiously and scientifically.

Dr. J. H. Metzerott, Washington, thought there was a certain field for the Finsen light. For instance, it would cure lupus as quickly as X-rays. He was confident as to the efficiency of the X-rays in curing tubercular processes, like fibroid phthisis. The efficacy of the rays in the cure of deeper growths has been a surprise to him: he has succeeded in some cases where he expected to fail. In superficial cases he has sometimes failed where he expected to succeed. In one case he was able to heal all of the ulcer except an area about the size of the end of the thumb, but in this area, to his surprise, he was unable to cause cicatrization. He treated a case of epithelioma of the lip which had undergone operation three times, with

good results, but returned each time, until the last, when it appeared in a neighboring gland. Operation was performed, and the area which he had treated by X-rays was found absolutely healthy.

DR. REYBURN, in closing, said that we fail in some cases because the tissues are infiltrated far beyond the apparent limits of the growth, and out of reach. Leucocytosis may explain the action of the rays, but to him the effects seemed very much like those resulting from the application of caustics. Of course, the rays penetrate much deeper. He was glad that Dr. Morton had met with success in the treatment of the deeper tumors; he, himself, had not. He wished, however, to give his personal experience, and hoped to obtain better results in the future. The failure of the knife in the treatment of cancer is well known. The application of X-rays is an admirable treatment, and much is to be expected from it in the future.

DR. J. N. HALL of Denver, Colo., presented a paper entitled

WHO MAY BENEFIT BY ALTITUDE TREATMENT?

The physicians in the Rocky Mountain region, he said, still see a considerable number of patients sent from other localities who might better have remained at home. It is not only a lack of trained judgment upon the part of a physician which may lead to the sending of unsuitable cases to the West. The very great majority of the patients we see have had the benefit of careful examination and discriminating estimate of their condition by excellent practitioners. But a few have been advised, not, to be sure, by men of the character of our own membership, to go to the Rocky Mountains, without the trouble even of stripping the chest for examination. Such carelessness is criminal. Certain patients with advanced lung trouble must have been sent with a certain knowledge that they could not live a month. Proper examination, honesty and the most ordinary judgment would prevent these errors.

Of the conditions suitable for altitude treatment in this region, pulmonary tuberculosis is the most important, as all

must recognize. The percentage of recovery depends more upon one factor than upon all others combined, namely, the stage of the disease. A large percentage of physicians recover from tuberculosis here. It is accounted for solely by the fact that the doctor with a beginning cough falls early into expert hands and is sent away with the first suspicion of the true nature of his disease. If all patients with cough were sent to the mountains upon the appearance of a few crackles in one apex, without waiting for dulness to appear, and even before a positively bacillary examination was obtained, there would be more well men and fewer diagnoses of consumption. After considerable dulness and even excavation occur at one apex, there is a fighting chance of arrest, and a good chance of delayed progress. Involvement of both lungs, except it be purely catarrhal, genrally precludes hope of complete arrest. "The predominance of the fibroid element in the tuberculous process is certainly favorable as to slowness of advance, but cases with this characteristic rarely attain the complete arrest often seen in the early catarrhal cases."

There is one variety of phthisis little dwelt upon in the text-books in which he believes the cases last much longer in elevated than in lower lying regions, viz., the type seen in certain young adults with moderate loss of weight, practically normal temperature, with little or possibly no appreciable dulness, but with constant cough, considerable expectoration containing abundant bacilli, great dyspnea, and upon examination, lungs bristling with fine moist rales. The prognosis is so much better as to time than one would at first believe that they should be carefully separated from the ordinary type and sent to the high, dry regions. The dyspnea may be severe for a time, owing to the obstruction of so many bronchioles, but the disease process does not seem here to extend to the lung tissue as one would anticipate.

Persons with a bad family history of tuberculosis may well consider the advantage of moving permanently to a high, dry region before the advent of signs of the dreaded disease. In cases where the lung does not entirely re-expand after pleurisy with effusion, two reasons should counsel us to send

them to a considerable altitude. Firstly, the rarer atmosphere favors the expansion of the crippled lungs; and, secondly, the development of tuberculosis is thereby directly rendered less likely. In addition, we have the general antituberculous effect of the climate, even though the lung cannot re-expand because of adhesions. I think there is no question that glandular tuberculosis progresses more favorably here than at sea-level. * * * * Many cases of asthma are permanently relieved in this climate. The less the association with asthma, or its twin evil, chronic bronchitis and emphysema, the greater the chance of such permanent relief. If, however, the emphysema be not extreme, or associated with weakness of the right heart, such cases may be safely regarded as favorable for altitude treatment. * * * * Almost constantly in those who have lived for many years in our mountains one may observe an increased chest development, virtually amounting to moderate emphysema. This is a compensatory process, because of the need of great lung surface. Its origin, however, should teach us that the improvement in asthma and chronic bronchitis in this region is in spite, and not on account, of the emphysema. On the plains of eastern Colorado the lesser altitude is more favorable for cases with decided emphysematous changes. The complication of tuberculosis of the lungs by organic heart disease often causes difficulty in deciding where to send a patient. In his opinion, we shall generally be right if we respect most the predominant condition. If any material dyspnea be caused by the heart trouble, only an incipient tuberculosis would probably be susceptible of improvement in a high altitude.

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DR. LOUIS KOLIPINSKI, Washington, read a paper on

THE THERAPEUTICS OF POTASSIUM COPAIBATE.

He stated that for nearly two centuries copaiba has been the standard internal remedy for the treatment of specific urethritis. Having referred to three theories which have been pro-

duced, claiming to determine the active principle of the drug, or the parts to which its virtues are due, he went on to say that copaiba, popularly and incorrectly called a balsam, is an oleoresin. Copaibic acid forms with bases combinations yet little known, soluble in alcohol and ether, insoluble in water. Potassium and calcium yield non-crystalline; lead and silver, crystalline salts.

Potassium copaibate is prepared in the following manner: eight parts by weight of copaiba are mixed with one part of potassium hydrate dissolved in a small quantity of water. On agitation or stirring, saponification results. The mixture is allowed to stand for a few days. Three layers are then found to have formed. The uppermost contains the volatile oil, if present. The middle one is potassium copaibate; the lowermost is the residue of uncombined alkali in water. Thus made it has these properties: It is a clear fluid of reddish brown color. At 50 degrees F. its consistency is gelatinous; at 63 degrees F., thick and oily; at 70 to 80 degrees F. it is quite liquid. Its taste is acrid and peppery; its odor similar to that of copaiba. The reaction is alkaline. It dissolves in alcohol, ether and chloroform. Its solution in water is opalescent, which soon becomes milky white from composition. The alkaline copaibates have properties much alike. Potassium copaibate was adopted as the best of its kind because it is a more stable compound; is more convenient to handle; is more agreeable to take and more certain in its effects than the copaibates of sodium and of ammonium. The dose of potassium copaibate is from 50 to 150 grains a day. It is best taken in gelatin capsules No. O.O., so-called ten-grain ones. Four to twelve capsules represent the daily amount.

The untoward effects of the copaibates are similar to those of copaiba, but are not so severe, frequent or constant. A patient may give up copaiba ad nauseam; not so the copaibate. The after-taste, eructations and gastric oppression are but seldom mentioned by those taking it. Lumbar pains do not appear, or are so slight as to escape comment. Overdoses produce strong laxative effects without corresponding diuresis. Those of costive habit find the bowels regulated. The proper

dose apportioned to the individual seems to improve the digestion; is without purgative effect and increases the urinary secretion. It produces skin eruptions—roseola and urticaria—as does copaiba, but these occur only in susceptible individuals from any dose, large or small. In a daily experience of several years four such instances of drug exanthem were observed. The histories of two of these cases, treated for gonorrhea, was given.

The copaibate of potassium is a soap. Used as such it will be found to be actively detergent, antiseptic in a moderate degree, and of an odor more or less aromatic. It is useful in some cutaneous diseases. The writer has cured with it chronic eczema of the hands and of the legs. Acne vulgaris and acne rosacea are improved by applying it undiluted and removing it by washing with water as soon as burning begins to be felt. Two or three drops to a fluid ounce of water offers a solution which is an agreeable cleansing and palliative spray in catarrh of the nose and throat. In laryngeal catarrh and in the hoarseness and enfeebled voice of singers and speakers it has been much praised by patients. Applied undiluted on pledgets of gause on ulcerating cancerous tumors it removes fetor, arrests purulent and putrid discharges and prevents hemorrhage. Its internal uses are like those of copaiba; its more particular actions are these. In anuria of the non-obstructive form it has been successfully used by the writer. In acute cystitis it often effects a cure and its power is more marked in women than in men. Chronic cystitis is palliated; pain and tenesmus relieved. The urine is less loaded with pus and mucus; decomposition is less active. In diseases of the respiratory tract, of the stomach and of the intestine, no action worthy of note has been observed. In cholelithiasis or gall-stones it has been found very useful. It compares favorably with the treatment by olive oil or the use of Carlsbad water, whether in the latter instance the patient be treated at home or is able to sojourn at this or that mineral spring. Not alone does the capaibate prevent attack of biliary colic but also when this has occurred the resultant jaundice is shortened in duration; the period of prostration is much lessened and

recovery very much sooner attained. Gall-stone disease is common and the cases suitable for surgical operation are comparatively rare. Therefore the multitude that suffers from minor gastric disturbance, transient pain, and occasional attacks of acute obstruction and expulsion is the proper class for which the copaibate can be commended. How the copaibate acts is obscure. It is not a solvent of a biliary stone. Two illustrative cases were narrated.

The chief use of the copaibate is found in acute gonorrhea. In the stage of gleet it is unavailing. Of the copaibate in specific urethritis it may be said: the proper dose can be steadily pushed from one to three months without unpleasant reaction. The copaibate is a powerful diuretic, increasing the secretion of urine 25 per cent. This effect cannot, however, be prolonged indefinitely in all cases. In a few instances it was observed to set up a polyuria. This polyuria disappears in a week, on the omission of the medicine. It is possible, however, that a grave form of insipid diabetes may begin, and in old subjects with chronic inflammation of the bladder or other portion of the urinary tract life itself may be thereby endangered. The course of an uncomplicated case of gonorrhea treated with the copaibate terminates often in complete cure in from one to two months. In an early urethral infection the copaibate, if begun at once, may in rare examples produce a cure in a few days. Where a heavy purulent or sanguineopurulent discharge shows itself, and the whole organ is hot and turgid, it mitigates in a high degree the scalding pain of urination and chordee is hardly ever felt. At the end of two or three weeks the discharge begins to abate, and often somewhat suddenly.

The chief merit of the copaibate is to be found in that it reduces the danger of complications to a minimum, so that gonorrheal bubo, epididymitis, Cowperitis, prostatitis, vesiculitis, cystitis, and stricture are seldom seen to arise. Upon the prevention of gonorrheal rheumatic infection an opinion cannot be expressed for want of cases so far encountered. Potassium copaibate possesses the virtues commonly assigned to copaiba with some special ones due to its solubility. These

are its uses on the skin and mucous membranes for its alkaline, detergent and antiseptic properties; its lesser tendency to disturb the economy by producing gastric and intestinal irritation. Further, it is much more palatable than copaiba. It is true that it produces the copaiba exanthems, but this need not of necessity cause its discontinuance. Posterior urethritis, whilst at times it does occur under the copaibate treatment, is then not at all common as a secondary extension.

In fine, to compare the copaibate of potassium as a remedy with copaiba, it may be judged the superior of the two because it is an exact chemical compound, and because its action is more precise.

DR. A. J. HALL, Washington, read a paper on

CAFFEINE IN THE TREATMENT OF ALCOHOLIC TOXEMIA.

Having remarked that one of the first features, and perhaps the most important of all, in the treatment of acute alcoholic toxemia, or an acute exacerbation of chronic alcoholic toxemia, is the withdrawal of the supply of alcohol, he said that a review of part of the symptomatology and pathology of acute and chronic alcoholism and of the clinical and experimental results obtained from the use of caffeine would seem to suggest caffeine as a specific for alcoholic toxemia. This he endeavored to show in the following table:

Symptoms and Pathology of Alcoholic Toxemia.	Therapeutic Effect and Physiological Action of Caffeine.
Kidneys are irritated and an increased amount of urine is secreted. If the irritation is too intense the glomeruli are swollen and the secretion of urine is diminished or prevented.	Three grains of citrate of caffeine is a diuretic.

The blood is improperly aerated. Waste material is retained in body.	Caffeine is recommended in all cases of venous congestion with intact kidneys. Three to five grains will prove calmant and restorative.
Sleeplessness and depression of spirits.	Tends rapidly to reinstate norma of temperature by retention. Fall of body temperature antagonized by caffeine. Supports the vital powers and resists tendency to collapse.
Reduces temperature, dissipates heat. Extreme coldness (fatal case) temperature 91° F. Continuous and prolonged discharge of body heat.	Is tonic to vasomotor nerves. Refreshes and stimulates the nervous system.
The first pathological stage of intoxication is one of vascular relaxation with vasomotor paralysis. Vasomotor paralysis always present.	Is of great use in attacks of dyspnea caused by sclerosis of coronary arteries.
The arteries are sclerotic.	Stimulates the cerebral and cerebro-spinal systems.
Defective circulation in brain reacts sharply on cell nutrition.	Is a powerful stimulant to the central nervous system.
The heart is always deranged—hypertrophic or atrophic. Its muscle walls enfeebled. Nutrition and control diminished. Dilatation. Heart failure.	Braces the nerves which govern the caliber of vessels, and so sustains the circulation. Three grains is a diuretic in cardiac dropsy. A much more active heart stimulant than is usually believed.
There are many unknown toxins which come from the spirit used and are formed by its actions on other substances.	Increases the loss of carbon by the organism; does not restrain the loss of nitrogen.

Chemical derangements of the processes of metabolism.	Formula $C_8 H_{10} N_4 O_2$. Carries large amount of nitrogen. Base xanthin, found in most of the organs of the body. Xanthin thus furnished may assist in processes of metabolism.
During convalescence an intense craving for more alcohol.	Caffeine seems to take the place of alcohol and to quench the desire for it.

From the above it is clear that the physiological antagonism of caffeine and alcohol has been recognized, and while at least one writer (Lewis Shapter) has proposed and endeavored to popularize an effervescent solution of caffeine as a substitute for alcoholic drinks, still the one feature which has been overlooked, and which is of prime importance to the therapeutists, is the fact that caffeine, administered in doses of one or two grains every one, two or three hours, will usually in twenty-four or forty-eight hours so effectually quench the thirst or craving for alcohol that most confirmed habitués will voluntarily abandon its use. This feature was illustrated in four cases which were narrated. While in one instance the caffeine did not succeed in displacing the alcohol, still the patient, a chronic drunkard, was for a time perfectly sober while consuming the usual amount of whisky.

Numbers of others cases, he said, might be cited, in which caffeine was given with good results.

Caffeine has its toxicological history, but as four grains have been given hypodermatically and repeated four times in a case of post-partum hemorrhage, and 4½ grains repeated 10 times in the adynamic state of typhoid fever, it would seem that there is a wide margin in which to allow for idiosyncrasies. Dr. Hall has not used more than two grains at one dose, and prefers the small dose at short intervals. As might be expected, most patients under the influence of caffeiene do not sleep, though some do; but their insomnia differs radically from that of alcoholism, and, so far as he has observed, does not lead on

to delirium. The condition it induces is described by patients as one of perfect contentment.

In conclusion, he hoped that he would not be misconstrued as advocating caffeine as a specific in all cases of alcoholic toxemia, to the exclusion of other remedies and measures. He was, however, strongly inclined to credit caffeine with a physiological antagonism to alcohol as clearly marked and as easily demonstrated as that existing between belladonna and opium. If this point is once established, the contention that alcoholism is a disease will be abandoned and the fact that it is a toxemia must be admitted.

DISCUSSION.

DR. LOUIS KOLIPINSKI, Washington, said that caffeine is undoubtedly a physiological antidote to alcohol, either in acute or in chronic poisoning. This antagonism will lead to its popular use.

DRUG STANDARDIZATION ABSOLUTELY NECESSARY TO ACCURACY IN DRUG THERAPEUTICS.

DR. F. E. STEWART, East Orange, N. J., read a paper with this title in which he emphasized the importance of the subject and stated that the profession is largely responsible for the present deplorable lack of uniformity of drugs in quality and strength. Physicians and pharmacists, he thought, should co-operate to secure remedial legislation. What is needed is a profession of pharmaceutical experts who shall ensure a standard materia medica supply. It must be created by legislation limiting the manufacture and sale of medicinal products to pharmacists, forcing them to carry on their vocation on a professional plane, and protecting them from unfair competition by obliging manufactures to publish the exact composition of their medicinal products and to tell the truth about them in their advertisements.

DR. W. H. WILEY, Chief of the Bureau of Chemistry, U. S. Department of Agriculture, read a paper on

CONTROL OF THE PURITY AND STANDARD QUALITY OF DRUGS.

After emphasizing the importance of drug control Dr. Wiley told of the investigation now being pursued by the Department of Agriculture. The object is to ascertain by analyzing thousands of samples purchased in the open market, the extent to which adulteration and fraud are carried in the drug trade, and then by bringing the facts before Congress to secure legislation which will protect pharmacists and the public against fraud, and guarantee to the physician drugs pure and of standard quality. This method was used successfully in securing the Pure Food Law, which went into effect July 1.

DISCUSSION.

DR. T. E. SATTERTHWAITE, New York, said this subject was one of the greatest importance, because the success of treatment depends upon the accuracy and quality of the medicines used. The great thing necessary is publicity. So much power is wielded by men on the "inside" that without the weight of public opinion the profession cannot hope to win the battle. It is pleasing to know that our agitation is bearing fruit, not as expected, through the agency of the Bureau of Materia Medica, but through the U. S. Agricultural Department, where Dr. Wiley is working indefatigably to bring about the desired result. In behalf of the Society he moved that a vote of thanks, and an expression of its appreciation of the work he has done and is doing for the benefit of the profession and public, be extended to Dr. Wiley. This motion was unanimously carried.

RECENT ADVANCES IN SPECIAL THERAPEUTICS.

SURGERY.

DR. C. BECK, New York: Schnitzler's statement that leucocytosis is present in cases of purulent appendicitis has been corroborated by many observers. Kyroscopy gives valuable

information in the diagnosis and prognosis of renal affections calling for nephrectomy. X-rays have simplified the diagnosis of many disorders. Phototherapy has given good results in the treatment of external malignant growths. Senn also reports curative effects in two cases of Hodgkins' disease. The treatment will not, however, replace surgery; it should be reserved for inoperable cases. Edebohl's statement that stripping the kidney capsule will cure some renal disorders requires further confirmation. Kehr's work in the surgery of the biliary passages marks a new epcoh. Czerny shows that renal tuberculosis is generally unilateral. Kronlein concluded from 264 cases of gastric carcinoma that unoperated patients will live one year; gastro-enterostomy prolongs life three and a half months; extirpation of the growth also adds fourteen months more.

LARYNGOLOGY.

DR. CHARLES H. KNIGHT, New York: During the past twelve months a few additions have been made to our pharmacopeia, but, as usual, the larger share of energy has been expended on improvements in surgical resources, and this in spite of a vigorous remonstrance by a distinguished British authority, Sir Felix Semon, against what he is pleased to call "a lust of operation." The writer desired to be classed as a conservative, yet he felt that it would be unfortunate if protests like that referred to should lead to extreme reaction from radical procedures capable of accomplishing definite good.

Further experience with paraffin prosthesis in deformities of the external nose has served to establish it as a feasible procedure and has brought certain improvements in technic. In order to keep the mixture fluid, as well as to protect the fingers of the operator from the heat, the syringe of Eckstein is provided with a soft rubber hood or sheath, while the barrel of Quinlan's syringe is surrounded by a hot water chamber. These instruments are thus open to the objection that the contents of the syringe are concealed while the bulk of the latter is inconveniently increased. We have learned, however,

that it is unnecessary to use the paraffin at a high temperature and, in fact, it is found to be safer and more satisfactory to introduce it in a semisolid state. The latter is accomplished most effectively by Harmon Smith's syringe, which is fitted with a piston controlled with power and accuracy by means of a screw piston rod. When paraffin of high-melting point is used, firm pressure and considerable care must be employed in moulding the mass to suitable shape, a small quantity being slowly injected. In this connection the observations of Comstock as to the fate of the injected substance are of interest. In a series of experiments he has demonstrated that the paraffin becomes in large part organized, in other words, is incorporated with the living tissues and is no longer a foreign body. Such being the case, one objection to this procedure is dispensed with; moreover, the danger from thrombosis, a possible accident with two fluid paraffin, is absent when one of high-melting point and at low temperature is used, and, finally, the risk of excessive local reaction is eliminated by careful observance of antiseptic details. Similar results have been recorded by Juckuff and Moszkowicz. Gersuny, the special promoter of paraffin prothesis, finds no advantage in using a mixture of high-melting point, and, indeed, ascribes to it the occurrence of pulmonary embolism and similar accidents. He, therefore, adheres to his original combination, and, in fact, is said to be experimenting with a still more fluid preparation, injecting a small quantity at weekly intervals until the desired results are attained. It is fair to conclude that in this measure we have a valuable and permanent addition to our resources. Yet we should not close our eyes to the dangers, some of them most serious, attending this operation. Cases of pulmonary embolism have been reported by Pfannenstiel and Halban. In one instance Dr. Knight has seen extensive sloughing of the skin over the dorsum of the nose, possibly from excess in volume or temperature of injected material, or from the use of a septic mixture, or instruments. He has recently heard of the sudden loss of vision in one eye a few moments after the injection. There can be no doubt of the formation of a thrombus of the retinal artery, the effects of which will be permanent.

Accidents of this kind are probably avoidable by observance of the following rules: (1) Thoroughly sterize the skin at site of injection, the paraffin mixture and all instruments to be used; (2) inject slowly a small quantity of paraffin at a low temperature and of semisolid consistence; (3) maintain pressure at the root of the nose during the injection and until the paraffin has solidified.

But the usefulness of paraffin is not limited to cosmetic purposes. It is claiming a place in the domain of therapeutics, and we find it applied to the cure of atrophic rhinitis. The submucous injection of paraffin in atrophy seems to have been resorted to with two quite different objects. First, simply for relief of subjective symptoms, as in the experience of Richard Lake. Still more interesting and more important, if true, is the claim made by Brindel, Delie, Bröckhärt and others that the functional activity of the mucous membrane is thus actually stimulated. It is easy to understand how the formation of crusts may be restricted and their expulsion facilitated by the more forcible impact of the air current upon a protuberant turbinate body, but one may be pardoned some skepticism regarding the possibility of revitalizing a defunct membrane by propping it up with a bolster of paraffin. We are prepared to admit the benefits of intraturbinate injections of paraffin as to drying and retention of secretion, while we await the test of time as to its power to regenerate wasted structures.

Closely allied to intranasal atrophy, in the opinion of some observers, is suppuration in the accessory sinuses. Grünwald holds that the latter is the cause of the former and stoutly sustains the theory of what he calls the "focal" origin of atrophy. An exactly opposite view is taken by Minder, who maintains that sinus disease is always secondary to intranasal inflammation. The question has an important bearing upon the therapeutics of sinus affections. Recent attention has been directed especially to the sphenoidal sinus, a cavity hitherto considered inaccessible and infrequently involved. The fact of a more intimate relation between these various cavities is established, the correct interpretation of some obscure symptoms has been determined, and many cases of sphenoidal empyema

are being reported. The study of the sphenoid has been concerned chiefly with the best method of approaching it when suspected of containing pus. The usual way has been to seek the ostium by crossing the middle turbinate obliquely and to enlarge the normal opening by breaking down the anterior wall. It has been pointed out that even in what we are in the habit of calling a normal condition the sphenoid is not widely separated from the maxillary sinus, and, in many cases, the dividing partitions are few and thin. Therefore, a more direct route to the sphenoid, especially when the nasal passages may be occluded, would be by way of the antrum of Highmore. Advantage has been taken of this fact by Jansen, Furet and others, who go so far as to recommend this method, even when the maxillary sinus is known to be healthy. In dealing with the sinuses, especially the sphenoidal, curious anatomical variations have been so often seen, that any improvement as regards technic or ease of access is to be welcomed. Yet the tendency of the time seems to be toward the belief that no better results are derived from extensive operation than from a moderate course which has in view free drainage and antiseptic irrigation.

Discussion as to the virtue of topical applications in diseases of the upper air tract will never cease. Sprays, pigments, insufflations, and so on, each have their advocates and opponents. The method of making an application is less important than its effectiveness; its agreeableness is a matter of some moment with many patients. In these respects new claimants for favor are trying to crowd out the time-honored silver nitrate. Silver gelatose, silver vitellin, silver ichthyol-sulphonate, silver-protein, and numerous other silver salts are offered as substitutes, with the claim that they are less unpleasant and more effective, because they do not form an insoluble combination with the secretions and hence possess greater penetrating power. His own experience has been in the main limited to silver gelatose and silver vitellin, which have been used in a great variety of inflammatory conditions, acute and chronic, in the pharynx and larynx. The assertions of Barnes, Lederman and others as to the non-irritating character of silver

vitellin even the strongest solutions and on the most sensitive membranes, have been confirmed. It does not appear to be quite certain that the effects are so pronounced and prolonged as with silver nitrate. Yet the milder measures are to be preferred, even though it is possible to show results only equally good.

Silver gelatose has been applied as a spray in 5- and 10-percent. solution to the pharynx and the larynx, the primary effects resembling those of silver nitrate, but being less violent, at first stimulation and, secondarily, decrease of secretion. Among other agents which have come into more or less prominence may be mentioned urea, given internally, in 5- to 20-grain doses three times a day in tuberculosis, and mucin given internally and applied locally for atrophy. All that can be said of them up to the present time is that they seem to act favorably.

In conclusion, attention should be drawn to the great dearth of interest in local therapeutics. It is true that much care and patience are necessary to permit an honest judgment as to the action of drugs, and that investigation in this line is much less attractive and exciting than in that of surgical therapeutics. Yet, on the one hand, surgery is not a panacea, and on the other, substantial benefits may be expected from a conscientious study of local medication. It seems worth while, therefore, to urge a more earnest cultivation of this much neglected field.

THE ROENTGEN RAYS IN DERMATOLOGY.

DR. E. B. BRONSON, New York: Compared with the achievements in phototherapy, at least those reported from Copenhagen, the results of treatment with the Röntgen rays are still in the experimental stage. That in the X-rays we have a more potent agent—certainly of greater potency for harm—than in the chemical rays of the Finsen light, there can be no doubt. Of its potency for good no one can be in doubt who has witnessed the effects—effects sometimes almost magical—in severe

ulcerating carcinoma, for example; in the quick subsidence of pain; the disappearance of fetor; the cleaning of the surface; the reduction of nodular infiltrations; the apparent healing effect, and certainly the relief of discomfort; if not the prolonging of life; in the curative effects in rodent ulcer, in lupus vulgaris, in lupus erythematosus; its ability to remove hair permanently as well as temporarily, in certain forms of eczema, nævus, warts and other superficial diseases; nor should be forgotten the remarkable effects produced in Hodgkin's disease.

And then there is the reverse side. When one has seen the truly horrible effects that may follow the reckless use of the rays—the so-called X-ray burns that may last for many months, or even years, not only with revolting disfigurement but with a torture of pain almost incessant,—it is enough to give one pause. Having referred to scleroderma, epithelioma, carcinoma and other serious conditions as occasional effects of the X-rays, Dr. Bronson said there was no agent of great energy for good that had not some contervailing dangers or disadvantages. It is only a question of proper adaptation. In radiotherapy, the most obvious and imminent danger is the burn, though by no means so serious as it was at first. Though severe burns still occur every now and then, they are of far less frequency than in the early days of Röntgen irradiation. Slight burns causing erythema and pigmentation are not rare nor of especial importance, and in treating the deeper-seated affections like lupus or cancer a much more severe reaction, up to gangrene of the diseased tissue, may not be objectionable. Healing takes place within two or three weeks, even in the latter case, without the production of unsightly scars. But the difficulty is to control the reaction so as to produce just enough and not too much effect.

Unfortunately our knowledge of what produces the effect, whether pathological or therapeutic, is only vague and indefinite. Many theories have been advanced, but few have held. The pathological effects of Röntgen radiation are for the most part confined to the skin. The changes effected on the interior are comparatively insignificant. Notwithstanding the extraor-

dinary penetrating power of the rays, and in spite of the fact that it is possible for evidences of trophic reaction to occur not only in that part of the skin nearest the tube, but also occasionally in the skin on the opposite side, corresponding with the point of emergence for the rays, all the intermediate tissues remain apparently unaffected. Kaposi is of the opinion that the Röntgen rays act on the blood-vessels in the deeper parts of the cutis in the same manner as strong sunlight, and cause hyperæmia, at first acute, then passive, which little by little extends to the more superficial vessels. Doutrelepont also, speaking of the reaction in lupus, refers the first effect to hyperæmia, which is accompanied by an abundant emigration of leucocytes from the vessels, and causes an infiltration resembling that seen from the action of tuberculin, especially about the lupus nodules, forming later fusiform cells and fibrillar connective tissue that gradually replace the lupus tissue undergoing degeneration. Schlotz assigns a more important part to the cell changes in the Röntgen reaction. First the epithelial cells undergo degeneration, and later, usually in less degree, the cells of the glandular organs, the vessels, the muscular and connective tissue. It is only after the cellular degeneration has reached a certain stage that the vessels begin to suffer and signs of inflammation appear.

The factors of greatest importance in the production of the reaction are:

1. The susceptibility of the individual.
2. The condition of the tube.
3. The distance of the exposed surface from the focus of the rays.
4. The duration of the exposure.

There is no obvious reason why the susceptibility of different individuals to the X-rays should not vary as much as the susceptibility to sunburn. A previous pathological condition of the skin, however, has a decided influence on the susceptibility. With the ability to regulate the action of the tubes so as to maintain a uniform radiation, both as to intensity and penetrability of the X-rays, many writers believe that the per-

sonal equation of the patient would be a relatively neglible quantity.

Much difference of opinion prevails with regard to the relative efficacy, as well as safety, of hard and soft tubes. French authorities generally prefer the soft tubes. Certainly a quicker and, as now generally admitted, an intenser reaction is produced by tubes of a moderately low resistance than by tubes of high resistance. There is little question that burns are more readily caused by low than by high tubes, and probably a speedier therapeutic effect, at all events in the more superficial affections. The higher tubes, however, having greater power of penetration, are thought better adapted to the deeper-seated affections. Various devices have been used, both with the object of regulating the condition of the tube and of affording greater precision in observation.

Certain it is that the intensity of the irradiation outweighs all other considerations. Whatever means are used to actuate the tube, whether static machine, Ruhmkorff coil or high-frequency apparatus, the effective agent is precisely the same; viz., the so-called X-rays. The amount of effect depends on the amount of radiation to which the affected part is exposed. The most important questions, then, after regulating the condition of the tube, relate to the distance of the exposed surface from the focus of the rays and to the duration of the exposure. The effect may be said to vary directly as the time and inversely as the square of the distance (it being assumed that law as to intensity that applies to ordinary light also applies to the X-rays). Granting this to be true, we may easily compare exposures of varying time and distance by reducing them, as suggested by Codman, to their equivalents in time at the distance of one inch. Even if the formula is only approximately correct, it is very useful for purposes of comparison and much better than mere guesswork. The standard which he suggests is 10 minutes at 6 inches, which would correspond to 0.28 minutes at one inch. This must be regarded as a major therapeutic dose, and intended for cases where a decided effect is desired. It certainly would be a strong dose for frequent repetition. A standard that better accords with general experience

would be 10 minutes at 8 inches (equivalent to 0.156 minutes at one inch).

Next comes the question as to the number and strength of the succeeding exposures. The question is rendered more complicated by the fact that the effect of successive irradiations is cumulative, at least in the sense that when a sufficient exposure to produce a certain effect has been made, if before this effect has declared itself—before the period of incubation has passed—other exposures are made, the ultimate effect will be an exaggerated one. If the first exposure alone only sufficed to produce a therapeutic effect, the effect of the added irradiations may be a burn. To avoid such a result directly contrary methods are employed by different authorities. Having referred to those of Oudin, Scholtz, Kienböck and Freund and Schiff, he went on to say that possibly the variations of method as illustrated in the above examples are no greater than obtain in the employment of many other therapeutic agents, and yet they leave in the mind an impression of uncertainty, of lack of precision, which in view of the possibilities of danger of this particular agent is a sufficient admonition to caution. There are similar variations in the application of Röntgen rays in the treatment of particular diseases. Thus in the treatment of lupus there is what may be called the escharotic method that aims at a speedy destruction of the lupus tissue and courts a decided inflammatory reaction, and the more conservative method of Freund, who, by milder and more often repeated exposures, seeks to effect more gradual changes and to replace the lupus growths by slow formation of new connective tissue. Whatever germicide power the rays may have, it is admittedly too insignificant to be considered. There are also marked variations of methods in treatment of superficial affections in the removal of hair, in acne, eczema, keratosis and psoriasis, for example. It is a comparatively easy and safe procedure to cause temporary fall of the hair by the X-rays, but to insure their permanent removal in hypertrichosis is quite another and much more difficult matter. Some follow the severer methods of Kienböck, of Scholtz, or that of Oudin,

while others prefer the more conservative plan of Freund. Ziessler, who follows Kienböck with slight modification, refers to very satisfactory results in hirsuties and reports thirty-four successful cases of acne of different varieties. Pusey also reports good results, but following the method of Freund. Freund states that the hairs fall out at the end of from twenty to twenty-five sittings. In from six to eight weeks a new growth appears, to forestall which at intervals of from four to six weeks the treatment is repeated for a few sittings; and this is continued till finally the hairs cease to grow, the whole course requiring from twelve to eighteen months. By more energetic treatment the periods may be somewhat lessened, but at the best it affords little advantage so far as duration of treatment is concerned over electrolysis. In favorable cases the results are superior to those of the latter method in the absence of pain and in the avoidance of scars, and would in every way be superior but for the constant menace of a "burn."

In treating broad, flat surfaces affected with superficial diseases, such, for example, as psoriasis or keratosis of the palms or soles, large areas may be included at one irradiation and without the troublesome screen, if at a considerable distance from the target (say at twelve inches or more), the difference in intensity between the peripheral and central rays under such circumstances being only slight; though much the same effect may be produced at shorter range by frequently changing the patient's position so that the central rays shall not act long upon any one spot.

That in many skin diseases Röntgen irradiation is a remedy of great value, at least as an adjuvant to other therapeutic measures, is a fact sufficiently established, but in very few instances is it likely to supplant entirely the older methods of treatment. No measure requires greater circumspection in its employment or a nicer adjustment of many details; and whatever be its promises for the future, it must be admitted that for the present it is a comparatively unknown quantity, and still in the experimental stage.

GYNECOLOGY.

DR. H. J. GARRIGUES, New York: Subcutaneous injections of gelatin to control hemorrhage are falling into disuse; suprarenal extract is preferable. Wernitz combats sepsis with rectal enemata of normal salt solution, continued an hour each time until temperature falls and diuresis is established. Two new mercury antiseptics have been introduced, the citrate and sulphate; they are bland, and equal the bichloride in antiseptic power. The Alexander operation for correction of retroflexion is gaining ground. Kreutzmann rejects ventro-fixation and ventro-suspension; in several instances it has necessitated subsequent Cæsarean section. He recommends low vaginal fixation, or shortening of the round ligaments. Dr. Garrigues does not favor the former. Oldebrecht has adopted Menge's method of treating chronic endometritis, the application of a fifty per cent. formalin solution for one or two minutes, repeated in a week if necessary. The tendency to use the vaginal route in every possible case is abating. Downes of Philadelphia has perfected Skene's method of extirpating cancer of the uterus with electro-cautery clamps.

MATERIA MEDICA.

DR. A. A. STEVENS, Philadelphia: Protective vaccination with sterile cultures of typhoid bacillus has been used with some success in the British Army. Statistics do not credit antistreptococcus serum with any decided reduction of mortality. Leyden reports fourteen cases of scarlet fever treated with serum from convalescents with favorable results. After discussing lumbar puncture and phototherapy, Dr. Stevens referred to the use of benzoyl-acetyl-peroxide in typhoid fever; it has been recommended by several writers, but it seems doubtful whether any intestinal antiseptic has power to stay the course of the disease.

Adrenalin chloride has gained a reputation as a vasoconstrictor. Untoward effects have been noted in animals; among them, glycosuria and degeneration of the islands of Lamgerhans in the pancreas after intraperitoneal injection of a 1 to 1,000 solution in dogs. This suggests as a possibility

that diabetes may be due to disease of the suprarenals. Kelynack demonstrates that alcohol predisposes an individual to tuberculosis. Gelatin maintains its value as a hæmostatic. Methylene blue, while not as potent an antimalarial as quinine, deserves trial when quinine cannot be given. Allyl-sulphocarbamide is recommended for softening keloid growths, cicatrical tissue, etc.

RECENT ADVANCEMENT IN THE THERAPEUTICS OF THE EYE.

DR. JOHN E. WEEKS, New York: In the treatment of this subject the discussion of the X-rays and the Finsen rays in their therapeutic rôle and of all surgical therapeutic measures, is purposely omitted. Of the newer anesthetics and analgesics, a few may be mentioned. Di-paran-isyl-phenetyl-guanidin hydrochlorate is used in the strength of 1-100 to 1-300 for the production of local anesthesia after the manner of cocaine. On the whole, it is inferior to cocaine as a local anesthetic, but it may be used to advantage for the purpose of removing foreign bodies from the eye and minor operative procedures, when it is not desirable to dilate the pupil or interfere with accommodation. Ethylmorphine hydrochlorate, in 5-per-cent. solution, has been used for the production of prolonged anesthesia and analgesia. When introduced into the conjunctival sac it produces smarting which is quite severe, edema of the ocular and palpebral conjunctiva and of the lids, and increased lacrimation. This lasts for from twenty to thirty minutes and is followed by analgesia which persistes from a few hours to thirty-six hours. It is said to cause striped keratitis when used to produce anesthesia for operations on the globe, and for this reason is contraindicated in operative procedures. The indications for its use are (1) for rapid resorption of the products of inflammation, and (2) for producing prolonged analgesia. It has been advised in glaucoma, iritis, iridocyclitis, and keratitis, for the purpose of relieving pain, and it is said to be very efficient.

Graefe advocates solutions of 10 to 20 per cent. in old corneal diseases, except those due to trachoma, in catarrhal con-

junctival affections, in iritis and iridocyclitis in combination with atropine. Other authors mentions it favorably in the treatment of corneal opacities. Benzolmorphine hydrochlorate has an analgesic and myotic effect. Used in 1- to 2-per-cent. solution in combination with atropine, cocaine, and eserine, it accentuates the effect of these remedies in the eye. Its use induces symptoms resembling those occasioned by dionin. Holocaine is a substance closely related to phenacetine. In a 1-per-cent. solution it is a decided germicide. Holocaine is used in ophthalmic practice in a 1-per-cent. solution. When dropped into the conjunctival sac, it causes only very slight irritation. The anesthesia, which is quite profound and affects the iris and ciliary body, as well as the conjunctiva and cornea, is rapidly produced, requiring only thirty to forty seconds and lasting eighteen to twenty minutes. It produces its anesthetic effect by paralyzing the sensory nerve endings, has no effect on the vessels and does not dilate the pupil or influence accommodation. While the most poisonous of the remedies used for local anesthesia, its use in the eye is not followed by any deleterious effects, and as it is more energetic than cocaine, it is of great value in ophthalmic surgery. It does not cause constriction of the blood vessels; consequently does not control hemorrhage. If used for operative procedure it may be advantageously employed in connection with cocaine and adrenalin. It is of value in the treatment of infected ulcers as well as in operative procedures.

Recently a number of preparations containing silver, which are non-irritating and which possess decided germicidal properties, have been introduced into ophthalmic practice. Of these three may be mentioned. The compound of silver and nucleinic acid is used in 5- or 10- per-cent. solutions. It causes no pain when introduced into the conjunctival sac, and is pleasanter to use and less sticky than protargol. It is efficacious in acute contagious ophthalmia, also in suppurative conditions of the lacrimal sac.

The albuminate of silver, containing 8 per cent. of silver, should be dissolved in cold water, as heat partly decomposes it. It is used in the strength of 2 to 20 per cent., the solution

being brushed over the conjunctiva or dropped into the conjunctival sac. The preparation, even in very concentrated solution, produces but little irritation when placed on the conjunctiva. The numerous reports on its use go to prove that it is of value in the treatment of all mucopurulent affections of the conjunctiva. The duration of ophthalmia neonatorum and of gonorrheal ophthalmia is shorter by some days when treated with it than when treated with nitrate of silver. A thickened condition of the conjunctiva sometimes follows the acute stage of ophthalmia when it is used, requiring its discontinuance and the employment of other remedies. It has been employed largely in the prophylaxis of ophthalmia neonatorum in the Boston Lying-in Hospital, with excellent results, and this, or one of the other albuminates of silver, should replace the nitrate of silver as used after the method of Credé in the prophylaxis of this affection. Silver vitellin has been used extensively in the treatment of purulent conjunctivitis, proving itself to be superior to the nitrate of silver and as good, if not better, than silver protein. Very little or no irritation is produced by placing concentrated solutions in the conjunctival sac. Barnes and Hille recommend its use in a 25-per-cent. solution in all cases of acute conjunctivitis. At the New York Eye and Ear Infirmary, where silver vitellin is employed to a large extent, it is used in a solution of 30 per cent. every two hours in severe cases of gonorrheal ophthalmia and less frequently in mild cases and when the disease is subsiding. No irritation is produced and, so far as has been observed, no untoward condition has followed the use of the drug. Ophthalmia neonatorum requires seldom more than seven days in the hospital when treated with it. In silver vitellin we have one of the most efficient, if not the most efficient remedy for the treatment of purulent conjunctivitis. The danger to vision from gonorrheal infection of the conjunctiva is indeed slight when vigorous treatment with strong solutions is instituted. It is also of much value in the treatment of purulent dacryocystitis. Colloidal silver is soluble in water in the proportion of 1-25. Unguentum Credé contains 15 per cent. of it. A two-per-cent. ointment, made with one part wool fat and ten parts white

vaseline as a menstruum, has been employed by Wolffberg in gonorrheal ophthalmia and in the treatment of parenchymatous keratitis. If dilatation of the pupil is desired, atropine in the proportion of one-half of one per cent. is incorporated. In gonorrheal ophthalmia a portion of the ointment as large as a pea is introduced well into the upper cul-de-sac by means of a glass rod, after cleansing the eye, and a small piece is placed in the lower cul-de-sac. The ointment is introduced every half-hour at first; in a day or two, every hour, and later less frequently. In parenchymatous keratitis, the ointment is introduced twice or three times daily. Wolffberg reports good results.

Trikresol, a combination of ortho-, meta- and paracresol, is advocated as an antiseptic in ophthalmic practice. It is used in the strength of 1-1,000, and is reliable and unirritating. It is recommended as a basis for solutions of atropine, etc., and for the purpose of washing the conjunctival sac. Acetyl salicylic acid is recommended by Krischner in rheumatic iritis and in other affections of the eye in which the salicylates are indicated, as it does not have the unpleasant effects of the salicylate of soda. Allyl-sulpho-carbamide has recently been advocated by Suker as beneficial in the treatment of corneal opacities, exudative choroiditis, plastic iritis, etc. Hyperleucocytosis is induced by its administration and "transudates and exudates are rapidly absorbed." It can be administered hypodermatically, but abscesses may follow. It may also be given in three-grain capsules once or twice daily. Topical applications may be made with a 10-per-cent. ointment. In order to obtain results that are of value, the remedy must be continued for some months; in some cases much more time is required. Suker has employed subconjunctival injections, but he is doubtful whether better results are obtained by this than by the other methods of administration.

Suprarenal extract, first introduced into ophthalmology by W. H. Bates in 1893, has ever since been recognized as a most efficient hemostatic. At the present time the active principle, adrenalin, is used in the form of adrenalin chloride, in solution, with acetone-chloroform. It may be employed in the eye in the

strength of 1-1,000 to 1-10,000. The operations of tenotomy, removal of pterygia, extraction of cataract with iridectomy and conjunctival flap, etc., are rendered much less bloody when adrenalin is used. It does not perfectly control the hemorrhage from the larger vessels of the subconjunctival tissue or the larger muscular branches, but makes it less profuse. Adrenalin chloride is valuable as an aid to increase the effect of cocaine, atropine and eserine. It is of value in iritis to enhance the effect of atropine when complete dilatation of the pupil is difficult to obtain, and in disease of the lacrimal passages, it aids in establishing the lumen of the canals.

Oxygenated vaseline combined with 3 to 10 per cent. of iodine has recently been advocated by Duane in ulcerative keratitis, the remedy being applied in the strength of 10 per cent. every second day until the process is arrested, when the applications are made less frequently. The writer has found the 10-per-cent. iodine preparation to be somewhat irritating when applied to corneal ulcers, but quite efficacious. He has employed it in private practice in a much weaker solution (0.5 to 1 per cent.) in a number of cases of mycotic keratitis, advising the patient to drop it into the eye every three hours. The results have been excellent. Iodoform, in the shape of powdered iodoform, has long been employed in the treatment of conjunctivitis, keratitis and wounds of the eyelids. In 1897 Ammann introduced sterilized iodoform powder into the anterior chamber of an eye in which there was tuberculosis of the iris and ciliary body. Haab, of Zurich, has employed small sterile iodoform rolls and plates in which the iodoform is rendered solid by combining it with gelatin. These little rolls and plates are introduced into the eye in beginning panophthalmitis, following wounds of various kinds from splinters of steel, copper, stone, etc., perforating wounds without retention of fragments of the substance that produced the wound, and post-operative infection. Haab is reported to have treated 23 cases with good results in 10 cases, fairly good results in 5 cases, and failure in 8 cases. The iodoform when placed in the anterior of the eye is slowly absorbed, three to six weeks being required. The eye is bandaged after the introduction of the iodoform and the patient is kept in bed.

Subconjunctival injections are employed for the purpose of direct medicinal effect and for the purpose of stimulating blood and lymph circulation in the tissues of the eye in certain diseases of the eye. The remedies employed are the bichloride of mercury, cyanide of mercury, sodium cinnamate, and normal saline solution. The results of the experience of many observers lead to the conclusion that the effect of subconjunctival injections of all of the remedies mentioned, except sodium cinnamate, is to stimulate the lymphatic and blood circulation, to convert indolent into acute processes, to increase nutrition, and to carry off effete material, rather than of any direct medicinal effect. Considered in this light, they are of value in slow forms of keratitis and scleritis and in many cases of uveitis. The experiments of Pflüger and of Lezenius indicate that sodium cinnamate is of value in tuberculous affections of the eye, in herpes corneæ, and in affections of the iris and choroid not suppurative in character. Injections of solutions of the bichloride of mercury deep into the orbital tissues in cases of orbital cellulitis have been used recently. The writer, acting on the suggestion of Dr. C. S. Bull, has employed injections of 1-1,000, in three cases, with excellent results, injecting 1 c.cm. of the solution deep into the tissue in three different places and repeating the injection in forty-eight hours if required.

Serum Therapy.—Diphtheria of the conjunctiva and cornea is the only disease of the eye in which serum therapy has been used to any extent. The antitoxin is injected as when used for diphtheria of the throat, introducing it into the loose tissues of the abdomen or in the tissues of the back just below the scapulæ. An initial dose of 1,500 to 2,000 units is given in the case of a child seven to ten years of age, and the injection is repeated in forty-eight hours if the process does not show decided signs of improvement. This method of treating diphtheritic processes in the eye has proved to be of great value. Antistreptococcic serum has not been used, so far as the writer is aware, but it would seem likely to prove of value in phlegmonous inflammations of the orbital tissues and lids due to the streptococcus.

RECENT ADVANCES IN ORTHOPEDIC SURGERY.

DR. HENRY LING TAYLOR, New York: The most picturesque event in our work during the past year has unquestionably been the visit of Prof. Adolf Lorenz to this country, and the public demonstrations of his method of manual replacement of the congenitally dislocated hip. In spite of previous attempts to correct this condition it was left for our European confrères, and especially Paci, Lorenz and Hoffa, to work out practical methods of reduction and retention. The battle has been waged between the manual and cutting operations with the result that within a well-defined age limit the so-called bloodless method is the method of choice, while various cutting operations, especially as applied to the older and severer cases, have their proper field. There is reason to think that both methods have their place, and that both are susceptible of still further improvement. The Lorenz operation illustrates the present tendency in orthopedics toward radical interference by simple methods. Experience has shown that the soft parts are much more tolerant of forcible manipulation than was formerly supposed, and that in the absence of bony anchylosis, deformed hips, knees and feet of severe grade and long standing may often be corrected at one sitting, with or without simple tenotomies, which formerly could either not be corrected at all or only by great expenditure of time and effort. To this is added the advantage that the long bones may be readily and safely cut or broken and adjusted wherever necessary to overcome deformity. They are nearly as amenable to interference and even to subcutaneous work as tendons. In both cases the perfection of the ultimate result will largely depend upon the mechanical after-treatment.

Along the line of the employment of great corrective force to the treatment of severe deformity is the well-known operation of Calot for the forcible correction of the kyphotic spine. While the operation proved to be less dangerous than would be *a priori* supposed, the results were unsatisfactory, and the employment of various corrective postures without anesthesia for the application of jackets is its only legacy. These verti-

cally or horizontally hyperextended postures for the application of fixed jackets appear to mark an advance in the treatment of Pott's disease of the spine. In the treatment of severe lateral curvature special exercises alone accomplish but little, and our German confrères are devoting much study and experiment to the working out of practical methods of applying jackets during forced correction, with some promise of advantage.

While the treatment of deformities has become more radical and more operative, the tendency is toward simplicity of method and away from the severe cutting operations, and especially from those procedures which demand a considerable sacrifice of tissue. In a word, while radical as to the amount and rapidity of correction, the tendency is toward conservatism as to the means. It is no longer good practice to take months or years to effect a correction that can be done as well or better at one or two sittings, though mechanical treatment is as important as ever, and frequently, if not usually, holds the key to the situation.

Another marked tendency in modern orthopedic work is the increase of interest manifested in pathology and the greater reliance on exact means of diagnosis. Considerable work is being done with blood counts and the microscopic and bacterial examination of growths and fluids. In some hospitals a culture is made from every abscess opened, and the X-rays are used, and used repeatedly, on practically every chronic joint. Tuberculin has also been employed with somewhat doubtful results, as a means of diagnosis. The result of these studies has been a more exact localization and pathology. There has been a distinct increase of interest in and knowledge of the non-tuberculous lesions and processes in or near the joints. Typhoid, pneumococcic, gonorrheal, syphilitic, septic and traumatic lesions are becoming more frequently recognized and more scientifically treated. This tendency is well illustrated by the remarkable work for adult cripples, done in the last few years by Dr. Joel E. Goldthwait, of Boston, and his associates. This is probably the most important movement in orthopedics at the present moment; it is being carried on with painstaking attention to the pathology, and has already

added greatly to our knowledge and therapeutic mastery of the crippling diseases of adult life.

The routine employment of the X-rays has led to the discovery that chronic osteomyelitic foci are not uncommon, and that these may often be extirpated with the relief of long-standing and sometimes obscure symptoms. It has also demonstrated that osteitis deformans, Paget's disease of the bones, of which only eleven cases have hitherto been reported in this country, is a fairly common cause of pain and disability in advanced life. Dr. Locke, of Boston, reports with radiograms 21 cases of this hitherto rarely recognized affection at the Congress of American Physicians and Surgeons.

Considerable work has been done in bone atrophy following acute and chronic lesions of the limbs. Function transference by tendon-grafting has lately come into prominence. The results have, on the whole, proved disappointing, though the method proves useful in certain cases and is still being improved by perfection of technic, better selection of cases, combination with other operations, and more careful mechanical treatment. Function transference through nerve suture is still in its infancy and of uncertain value. Suture of the brachial plexus for obstetric palsy has recently been done with asserted benefit.

There are now three German and two French journals, and one Italian journal, devoted to orthopedic surgery, besides the Transactions of the American Orthopedic Association, of which the fifteenth annual volume has just been published. This contains a list of about three thousand papers on orthopedic subjects selected from medical literature in the last two years. A recent investigation by Dr. Harry M. Sherman of San Francisco, late President of the American Orthopedic Association, showed that about half the medical colleges in the Association of American Medical Colleges afforded instruction in this branch. Several of our large cities have well equipped orthopedic hospitals, wards or clinics under the direction of competent surgeons. There are national orthopedic associations in England, Germany and the United States, of which

ours is the oldest; there are also local societies in Chicago, Boston and New York. It may thus be fairly said that the specialty has cast off the swaddling clothes of its early limitations, and is in a healthy state of vigorous growth.

RECENT ADVANCES IN GENITO-URINARY SURGERY.

DR. JAMES PEDERSEN, New York: Advances may be noted in surgery of the kidneys (with special reference to nephropexy and nephrolithiasis), and in surgery of the ureters and of the prostate; in the more medical aspects of the subject, advances may be noted on the hard fought ground of gonococcal infection of the urethra, in attempts at asepsis of the genito-urinary tract, and in means to determine the functional integrity of the kidneys.

Nephropexy.—This operation has received considerable attention because of many unsatisfactory results in spite of elaborate technic. Two explanations are at hand for these failure: (1) The kidney becomes immovably fixed or abnormally rotated and fixed; (2) the nephroptosis proves to be only a part of an unrecognized splanchno-ptosis. Guiteras, in a recent article reviewing this operation, shows that the majority of accepted methods to-day include an oblique lumbar incision, to a greater or less extent, and suture with absorbable material so introduced that it includes the reflected capsule with more or less parenchyma or none, and more or less of the muscle portion of the abdominal wall to the entire exclusion of the skin. By the following technic he obtains the permanent restitution of a kidney to practically its normal position without total loss of its normal rotation on its horizontal axis. Through a vertical incision one-half of only the posterior surface of the kidney is denuded, beginning at the convex border and stripping up the capsule toward the concave border. Two sutures of chromicized catgut, one at the junction of the upper and middle third, the other at the junction of the lower and middle third, are now passed through both the reflected and attached portions of the capsule close to the attached border formed by

the reflection, then along it for three-quarters of an inch and out again. At the same levels two similar sutures for the anterior surface are passed by means of a blunt needle. Both of these anterior sutures begin under the cut margin of the capsule at the convex border and run at right angles to it under the capsule covering the anterior surface of the kidney for three-quarters of an inch, parallel with the convex border, then under the capsule again and back at right angles to the cut margin and out from under it. The two upper sutures are then carried through the muscles and fasciæ just below the twelfth rib, three-quarters of an inch to the inner and outer side respectively of the incision through the muscles. Similarly the two lower sutures, at a level corresponding to their position in the kidney capsule. The wound through the muscles is then closed by interrupted sutures, after which the upper and lower posterior kidney sutures are tied singly, with enough traction to bring the posterior surface of the kidney firmly against the abdominal wall, while the upper and lower anterior sutures are tied with just enough traction to support the outer limit of the decapsulated area.

Another ingenious method is that published by B. B. Davis, in May, 1902. It consists in making two vertical flaps of the capsule on the posterior aspect of the kidney by means of a vertical incision through the capsule near the convex border, reaching to within one inch of the poles with a cross incision at both ends. By blunt dissection a slit is then made through the quadratus lumborum muscle half an inch from its border; through this slit the inner flap of capsule is drawn and then united to the outer flap along its vertical edge, which has been brought through the original incision for this purpose, thus forming a bridge over an intact attached strip of muscle. Carwardine, an English operator, is among those opposed to decapsulation. In addition to surrounding the kidney by gauze slings, as practiced by Senn, he paints its whole surface down to the hilum with pure carbolic acid, thus adding to the exudation of plastic lymph whereby the kidney is cemented more

firmly in place. No doubt the present tendency to use absorbable sutures and to avoid the parenchyma will continue to grow. Furthermore, a more careful selection of cases likely to be benefited by the operation is apparent, splanchnoptosis being suspected whenever a freely movable kidney is found.

Nephrolithiasis.—It is in the diagnosis of this condition as much as in its surgical relief that advances have been made. As to the latter, apparently there is an increasing disposition to bring the kidney out through the lumbar incision, to thoroughly examine it there and, whenever possible, to suture the incisions made in it instead of packing them. As to the former, Johnson, in a recent paper, draws the following conclusions from his personal experience: "The positive diagnosis of kidney stone by the X-rays is reliable and of great practical value. The negative diagnosis of kidney stones by the X-ray is reliable and valuable up to a certain limit. If pictures of a proper quality are obtained, calculi of oxalate of lime and phosphates, can be excluded. Pure uric acid calculi cannot. Pictures of a proper quality can be obtained with ease in children and slender adults of both sexes. Such pictures can usually be obtained by repeated trials in well nourished adults. When patients are unusually stout . . . the conditions are extremely difficult, and only occasionally will a satisfying result be obtained with the present form of apparatus." These concise conclusions suggest that the disproportion in the results of different observers is due to the percentage of cases of primary calculus, plus the percentage of unfavorable subjects in the total number examined. A final note here is that the ureteral sound has been used to detect a renal calculus.

The Ureters.—A redoubled interest in operative procedures upon the ureters is apparent since the radiograph, the perfected cystoscope with ureteral catheter and sound have demonstrated that calculi are frequently permanently arrested in their descent from the kidneys. The radiograph locates a calculus in the ureter more positively perhaps than one in the kidney. The ureteral sound, in addition to detecting a calculus

or stricture, gives valuable information as to the course of the ureter when left in place and radiographed.

As is well brought out by Young, of Baltimore,, the upper two-thirds of the ureter had presented no great difficulties, while the lower third, the pelvic portion, was held to be inaccessible by at least one authority, as recently as 1898. Young, reporting cases of his own and giving a study of cases in the literature, shows that to-day calculi are removed from, and strictures divided in, the intrapelvic portion extraperitoneally, through an iliac incision beginning above the middle of Poupart's ligament and running upward and outward, one inch anterior to the anterior-superior spine. On stripping up the peritoneum the ureter is usually found adhering to it. A further advance may be noted as hinging on the above—often a tuberculous ureter is now removed entire with the diseased kidney, whereas formerly a partial and sometimes very meager ureterectomy was made to suffice.

It is another matter when we take up transplantation of the ureters. Opinions and results are diverse. The risk of ascending infection remains great, but it would seem that transplantation including that portion of the bladder surrounding the ureteral orifices gives the best results.

The Prostate.—More than one present-day writer, commenting on the hitherto desultory progress in surgery of the prostate, adds with evident satisfaction that at last the morbid anatomy of this important organ has come to be appreciated in its true relation to the tenure of life, and that advances made during the past few years in the study and treatment of prostatic enlargement have carried the progress up to the level attained in the other fields of surgery. To-day's advance in surgery of the prostate is marked by less reliance upon the Bottini operation; some desertion of suprapubic prostatectomy; a more general adoption of the perineal route; the use of retractors instead of counter pressure through a suprapubic incision into either the bladder or the prevesical space; fewer attempts to remove every portion of the gland. Perineal prostatectomy is performed through a transverse or V-shaped incision by dissecting down upon the anterior rectal wall and following it up

to the prostate, which is then seized by a tenaculum or forceps more or less specially designed for the purpose, drawn down and incised; it is performed through a vertical incision by opening the membranous urethra on a staff and incising the prostate in the middle line of the prostatic urethra, or by then breaking through the thin lateral walls of the prostatic urethra with the enucleating finger. By whatever incision the prostate is reached, enucleation is performed by the finger, beginning at the posterior limit of the gland and working forward to the apex. Occasionally a blunt curette or a pair of forceps to seize the loosened lobes is used to assist in their removal. A unique procedure is that reported by a French surgeon and advised by him in cases of soft, diffusely hypertrophied prostates, situated high in the pelvis. It consists in isolating the gland. Therefore he calls it prostatomonose. He reaches the gland through a prerectal incision and frees it from the surrounding tissue. The isolation is supposed to bring about a rapid contraction or atrophy. The Bottini operation now has a narrowed field in which prostatic bars, moderate enlargement, and the refusal of the patient to submit to more radical intervention form the chief indications. The modification suggested by several—that of performing the operation through a perineal opening into the membranous urethra, has been practised with evident satisfaction, affording as it does better access to the gland and the bladder, bladder rest, prime drainage of the bladder and good ultimate results. With the same objects in mind the enlarged prostate has been incised with the ordinary Pacquelin cautery through a suprapubic opening.

The Treatment of Acute Gonorrheal Urethritis.—Advance along this important line during the past year is marked by silver vitellin, and its wide acceptance as the best anti-gonorrheal drug we have to-day. The reports and comments of many observers go to show that, though its percentage of silver and, therefore, its efficacy are greater than that of any of its predecessors, in solutions as high as 20 per cent. it is unirritating to the urethral mucous membrane. Even a two-per-cent. solution used as a hand injection twice daily by

means of a one-quarter ounce hand syringe and retained in the urethra five minutes, shortens the acute stage so positively that it amounts to an abortion of the disease in cases seen in the very incipiency of the invasion. In selected cases Swinburne used a twenty-per-cent. soluition to abort the disease. Evidence is increasing as to its value as an irrigation in various forms of cystits, including the tuberculous, and as an instillation into the prostatic urethra in prostatitis with prostatorrhea.

Asepsis of the Genito-Urinary Tract.—Two new preparations designed for this purpose have been brought forward. One is defined as a hexamethylenetetramin potentized by a combination with anhydromethylene citric acid, and it is said to be unirritating to the digestive tract and to give off free formaldehyde rapidly, even in strongly alkalin urine. The other is a solution of lithium methaminate in an aqueous extract of triticum and zea. It is of great value in doses of from one to two drams 4 to 8 times daily, in meeting the indications for which it is designed.

The Functional Integrity of the Kidneys.—The *Medical Review of Reviews* gives an abstract of Dr. Rumpel's paper in the *Münchner medicinische Wochenschrift* on the determination of the freezing point of the blood and urine in which the following appears: "With intact kidneys the concentration of the blood remains constant. . . . Thus, practically it is possible to determine whether there is a unilateral or a bilateral lesion. . . . In determining the indications for operation, a normal concentration of the blood will exclude bilateral renal disease. . . . The determination of the function of the kidneys as shown by the degree of concentration of the blood and urine is of great practical importance in the diagnosis and treatment of renal diseases." Thus it appears that a reliable index is being found in the freezing point of the blood and the urine; but the present technic of the test is so difficult that the possibility of error is great, and whether the test will ever become clinically applicable remains to be seen.

NOTES ON OBSTETRICAL THERAPEUTICS.

Dr. Charles M. Green, Boston:

THE TREATMENT OF PUERPERAL INFECTION.

I. *With antistreptococcic serum.*—Although general interest in serum therapy for this still prevalent complication has notably waned in the last few years, the hope is not dead that scientific medicine may yet evolve a rational serum treatment for streptococcus infection. Drs. Packard and Willson (*American Journal of Medical Sciences,* Dec., 1902), in a summary of the present status of this subject, point out that to overcome the practical difficulty of obtaining a serum suited to specific cases, efforts are in progress to render serum as polyvalent as possible by immunizing animals with as many different strains of the streptococcus as possible. An ideal method of obtaining an effective serum would be to immunize the animal with the toxins of a given patient, and with the serum thus obtained to treat the patient from whom the toxins were taken. Unfortunately, under present known methods, the process of obtaining the serum thus requires too long a time for its availability in a given case. The attempt to obtain a polyvalent serum is one in the right direction; and the future may have a success in store for us.

II. *With intravenous use of formalin.*—Despite a few apparently successful results, Dr. Park, of the New York Health Department, after a series of careful experiments on rabbits, has shown that the intravenous injection of formalin is not only useless, but is attended with considerable danger, on account of the baneful effect of this agent on the blood, in causing disintegration of red corpuscles. Indeed the infected rabbits treated with formalin injections died sooner than those which had to contend only with the streptococcus. Obviously a safe and effective intra-vascular antiseptic agent against the streptococcus is not yet known.

III. *With intelligent, painstaking prophylaxis.*—As in the case of puerperal eclampsia, the most effective therapeusis against puerperal infection is prevention. But, notwithstand-

ing the efforts of didactic and clinical teachers in the last two decades, there is still a deplorable amount of puerperal sepsis. The responsibility for this lamentable condition rests not upon scientific medicine and medical teachers. The nature of puerperal sepsis is well understood, while the methods by which infections are to be avoided are readily formulated, and are easily learned and put in practice. No well regulated lying-in hospital or teaching obstetric clinic has to-day a noticeable septic mortality. Granting that house patients of lying-in hospitals are safeguarded by superior facilities, it is far from true that large out-patient clinics are equally fortunate. Yet what are the results? The out-patient service of the Boston Lying-in Hospital cared for over 1,800 cases in the year 1902, with a septic mortality of less than 16-100 of one per cent., and the work was done by third-year medical students, supervised by the Hospital Staff. Doubtless other teaching clinics have equally good results, which can be attributed only to sound teaching, painstaking supervision, and conscientious individual work on the part of the medical student. In teaching the lesson of obstetrical asepsis, too much emphasis cannot be given to the fact that obstetrics is specialized surgery; that there is no essential difference between surgical and obstetrical asepsis; that in obstetrics as well as in surgery, not alone hands and instruments, but the field of operation, must receive adequate antiseptic preparation. The perfect sterilization of instruments is now possible, reasonable care may give suitable preparation to the vulva and to the contiguous parts which need be touched; but the asepsis of the naked hand is still a matter of uncertainty. The use of the sterilized rubber glove, however, removes all uncertainty in this particular; and the time has come when this addition to our aseptic preparation must be accepted and adopted. Admitting then, as we must, that the teacher and clinician are doing all they can to spread abroad the lessons of puerperal asepsis, the duty yet devolves upon the profession at large not only to practice but to preach the doctrine of Oliver Wendell Holmes and of the martyred Semmelweis, and to invoke the conscientious efforts of all our colleagues in the obstetric art to the end that puer-

peral fever may become one of the rare enemies of human happiness.

THE USE OF SUPRARENAL EXTRACT IN THE TREATMENT OF UTERINE HEMORRHAGE.

Dr. George T. Harrison has made use of adrenalin chloride in the treatment of uterine hemorrhage. He has found it efficacious in five grain doses, t.i.d., in the treatment of chronic hyperplastic endometritis, with hemorrhage persisting even after curettage. In bleeding fibromyomata uteri Harrison believes that suprarenal extract excites to contraction not only the non-striated muscular fibers of the blood-vessels, but also those of the uterus. In proof of this belief he has observed that painful uterine contractions are evoked by the extract. It is supposed that the extract causes contraction of the uterine muscle, and that this uterine contraction produces as well a diminution of caliber in the blood vessels,—hence diminished nutrition and, besides, direct pressure, with resulting retrogressive changes. If these observations are valent, we should expect benefit to result from the use of adrenaline in cases of post-partum subinvolution. Bates asserts that the extract has been used locally with effect in post-partum hemorrhage; but it could hardly be expected to act quickly enough when administered internally. In metrorrhagia occurring at the menopause, De Brand has found the solution of adrenalin chloride effective when ergotin had failed; and he believes the drug to be of great value in severe uterine hemorrhage. Evidently this new therapeutic measure is worthy of further investigation.

OBSTETRICAL ANESTHESIA.

On the discovery of sulphuric ether anesthesia, and from the advocacy of Walter Channing, the first professor of obstetrics in Harvard University, it was at first supposed that the pain of parturition was at an end. But while a reasonable use of ether has proved to be an inestimable blessing, not only in operative labor, but as a palliative in severe types of spon-

taneous delivery, it has been found that ether, and chloroform as well, when used to the extent demanded by many women, often produces uterine inertia, necessitates operative intervention, and also predisposes to post-partum bleeding.

Medullary narcosis has been advocated to meet the demands for a safe and effectual method of relieving the pain of labor. But Professor Jewett, in his paper read before this Society in 1902, said that it is by no means proved that spinal cocainization is safer than other methods in the presence of chronic visceral affections; and he quoted Bogart, who, after a long experience with spinal anesthesia in surgical practice, has expressed the belief that its dangers are too great to justify its use in ordinary obstetric practice, and that in obstetric operations ether is safer and better.

Von Steinbüchel, of Graz, has done an important service by investigating the merits of scopolamine-morphine narcosis. He points out that the ideal narcotic for obstetrical use should have the following qualities: first, it should allay pain without diminishing the force of the uterine contractions; second, it should not be of itself dangerous; third, it should not increase the dangers of inhalation narcosis, should it become necessary to resort to the latter; fourth, it should not endanger the life of the fetus; fifth, it should not produce or favor post-partum uterine inertia. Von S., in a series of cases, tested the scopolamine-morphine treatment, and concluded that this method satisfied the above conditions; that it not only relieved pain without injurious effects, but insured in many cases a normal, physiological birth, and made operative intervention unnecessary. Dr. Green has recently tested this method in the Boston Lying-in Hospital, in 19 cases, 16 primiparous and 3 multiparous. Scopolamine hydrobromate and morphia nitrate were so combined that ten minims of the mixture contained 1-200 grain of the former, and 1-6 grain of the latter, drug; it was administered by subcutaneous injection. Having given a *résumé* of these cases, he stated that as a result of these observations, it would seem that in scopolamine-morphine narcosis we have a valuable addition to obstetrical therapeusis; that while in the few cases observed there was no

apparent benefit to multiparæ, the good effects in primiparæ were very marked. The combined use of the drugs seems especially serviceable in primiparæ of nervous, excitable, and hyperesthetic organization; and the best results are obtained when the drugs are given early in the first stage, as soon as symptoms of nervous irritability manifest themselves.

THE ETIOLOGY AND TREATMENT OF PUERPERAL ECLAMPSIA.

In a discussion at the Obstetrical Society of Philadelphia in February last, Dr. Stricker Coles expressed his belief that by careful attention to early symptoms 90 per cent. of eclampsia can be prevented; and he further said that he had never seen a patient with a form of eclampsia that could not have been prevented. In support of Dr. Coles' belief, Dr. Green could say that in a practice of twenty-five years he had never had a case of puerperal eclampsia among women of whom he had the care during pregnancy; the many cases of eclampsia he had seen had all occurred in consultation and hospital practice. Numerous cases had caused him anxiety and watchful care, but with painstaking attention to diet, to hygiene, to the condition of the nervous system, and to the functional activity of the eliminative organs, these cases had passed through their labor and puerperium. However meritorious and successful the treatment of actual eclampsia may be, we must all agree that, as in most other pathological conditions, prevention constitutes the most rational and the most successful therapeusis.

The theory that ascribes eclampsia to thyroid inadequacy, and the work of Nicholson on this subject, are of interest, and may prove of value. Jewett believes that Nicholson's conclusions are based on insufficient grounds, but it would seem that the theory of thyroid inadequacy and of treatment based thereon are worthy of further investigation. Anyone who has had much experience with eclampsia must be impressed with the fact that, as cases differ in symptomatology, in severity, and in the time of pregnancy, labor, or puerperium at which the seizure occurs, there can be no definite line of treatment

applicable to all cases, but that while following certain general principles the obstetrician must treat each case according to its own conditions. Many therapeutic measures have been found of more or less value in the treatment of eclampsia. Ether and chloroform have proved efficacious in controlling convulsions when promptly administered before the seizure actually occurs; chloral alone or combined with bromides is serviceable in mild cases and as an adjuvant to other sedative measures; Stroganoff's combined use of morphia and chloral has been successful in the experience of some observers. But recent experience has shown that in hyoscine and morphia in heroic doses we have a potent agent for the control of extreme restlessness and maniacal excitement. Three cases observed in the Boston Lying-in Hospital were cited in illustration.

RECENT ADVANCES IN THE THERAPEUTICS OF PEDIATRICS

Dr. Noble P. Barnes, Washington: In no department of practical medicine is the preservation of health, or the prevention of disease, presenting a more promising field of usefulness than in the guardance of those in whom we place our hopes of futurity. As to the normal management of the normal child, loose-fitting garments, hung from the shoulders, have been advocated for years; yet not until recently has it been satisfactorily demonstrated that the clothing usually employed for the new-born is so binding and burdensome as to restrain muscular development, hinder many functional processes and cause marked skeletal deformity. The pressure of the heavy diaper not only hinders muscular movement and development, but produces deformity of the pelvis and hip joint. Gauze-covered absorbent cotton pads, held in place by a light T-bandage, are much more satisfactory. This year has again emphasized the fact that breast-fed babies surpass in every respect of development those fed by hand; and that to approximate normal human milk by percentage modification of pure, clean cow's milk, is the best second method.

During the last two years Dr. Barnes has proved to his own satisfaction the usefulness of thyroids in mammary inac-

tivity. He narrated four cases in which they were given with good effect, and said that several other patients had responded promptly to the administration of thyroids, while in no instance was he disappointed with the results. Acute infectious diseases in the mother have always been held as contra-indicating maternal feeding, but Neisser's experience with a wet-nurse who had diphtheria, and reports of other cases where mothers, while suffering from an attack of diphtheria, had nursed their infants, without the latter taking the disease, seem to suggest that such milk acts as an antitoxin to the child. Few physicians or mothers will agree with Dr. Winters, that lactation to the eighth month is contrary to nature; and that weaning should be begun after the second month and should not extend beyond the fifth month. According to nature, the mother's milk supplies all the materials necessary for the growth and development of the infant up to the eighth or ninth month; and nature marks the time of mixed feeding by the advancement of dentition and a more pronounced amylitic action of the salivary secretion, which is from the seventh to the twelfth month, according to the degree of development. It is at this time that we can supplement the mother's milk with modified cow's milk with barley water, or preferably with oat-meal jelly. After the twelfth month the soft-boiled egg, the bread crust, the gluten cracker, and oat, rice and barley jelly may be added to the milk diet. At no time should the child be given whole milk unless other foods be administered simultaneously to prevent mass curd. Fruit, especially orange juice, can be given early, but meat should not be given until after the second year, and even then sparingly. A generous meat diet stimulates increased metabolism and nervous excitation, overworks the digestive system and overtaxes the eliminative organs, leads to various functional disturbances, and, like candy, creates a dislike for food more adapted for the growing child.

It is a lamentable fact that "too many babies are put on bottles for lack of rational treatment of the mother," and while some thrive on any combination of food products, the only rational substitute for the mother's milk is pure, clean cow's

milk, modified to meet the requirements in each individual case. During the summer the only milk that can be depended upon for the city baby is obtained from a carefully selected herd of cows, kept under proper management, and the milking and further handling of the milk conducted in a cleanly manner.

The prevalence of mammitis is one of the sources of streptococci in market milk. The common methods of handling milk, the proximity of the stables, the unclean cans, the street drawing, and many other conditions open to infection, give us a milk that is dangerous even if pasteurized. Generally speaking, pasteurization is always needed for even the best of obtainable milk, especially in the hot months; and the market milk of cities should not be given to the babies during the summer. Experiments conducted by the Bureau of Animal Industry, the U. S. Department of Agriculture, and other similar investigations, justify the following conclusions respecting the infection of milk from tuberculous cows:

(1) The tubercle bacillus may be demonstrated in milk from tuberculous cows when the udders show no perceptible evidence of disease, either macroscopically or microscopically. (2) The *Bacillus tuberculosis* may be excreted from such an udder in sufficient numbers to produce infection in experimental animals both by ingestion and inoculation. (3) In cows suffering from tuberculosis the udder may, therefore, become affected at any moment. (4) The presence of the tubercle bacillus in the milk of tuberculous cows is not constant, but varies from day to day. (5) Cows secreting virulent milk may be affected with tuberculosis to a degree that can be detected only by the tuberculin test. (6) The physical examination or general appearance of the animal cannot foretell the infectiveness of the milk. (7) The milk of all cows which have reacted to the tuberculin test should be considered as suspicious, and should be subjected to sterilization before using. (8) Still better, tuberculous cows should not be used for dairy purposes.

Anemia is one of the common neglected conditions, the result of many sins of omission; dental decay, resulting in local

and general sepsis, insufficient mastication and chronic indigestion; nasal stenosis and adenoiditis, resulting in chronic catarrhal conditions of the respiratory passages, physical weakness, and mental apathy; eye-strain and ear inflammations that produce an inexhaustible train of symptoms; these, and many other similar ailments should receive more general and more prompt attention.

A symptom that demands immediate relief is convulsions. They may be simply reflex and well likened to the chill of the adult, nevertheless they can and do produce great and lasting damage; and every attack should be shortened as much as possible. Likewise in asphyxia neonatorum, pertussis paroxysms, and any condition that might produce intracranial hemorrhage, or increase cerebral hyperemia, resulting in encephalitis, paralysis, epilepsy, idiocy or death.

In Dr. Barnes' experience convulsions, hysteria and epilepsy are invariably associated with chronic intestinal indigestion, but Smith insists that in instances where the fits occur in a child whose digestive system is temporarily disordered we may reasonably expect complete cessation of symptoms and permanent restoration of health by proper treatment.

A further step in prophylaxis would be the prompt report and isolation of all contagious diseases. This is possibly only where inspection of schools is conducted by competent physicians. Measles and pertussis are causing more distress and death than many of the other contagious diseases. During 1902 in 18 of the large cities in this country, there were 806 deaths due to variola, 986 due to measles and 1,238 due to pertussis. In London, in 1901, scarlet fever caused 590 and diphtheria 908 deaths. During the same period deaths from pertussis numbered 1,589 and deaths from measles numbered 1,952.

Having devoted some attention to anæmia, convulsions and the prophylactic importance of more prompt report and isolation of all contagious diseases, he went on to speak of the serum treatment of scarlet fever. Baginsky found streptococci in 696 out of 701 scarlet fever throats and concluded that the streptococcus is the cause of scarlet fever. However, treat-

ment with Marmorek's antistreptococcus serum proved negative. Aronson's serum from horses injected with streptococci from scarlet fever subjects is decidedly encouraging. Moser obtains a serum in the same manner as Aronson, and in 84 cases of all grades where it was used, 68 recovered, a mortality of 19.4 per cent. Of 26 cases treated by Baginsky with Aronson's serum, 23 recovered, a mortality of 11.6 per cent. Fischer used Aronson's serum in two cases and claims that the effect on temperature, which comes down by lysis, shows that it inhibits bacterial products. Right in the midst of this comes Charlton with the statement that in scarlet fever the streptococcus leads to secondary infection and that antistreptococcus serum is therefore indicated. He reports its use in 15 cases with 2 deaths. The antidiphtheritic serum has been used and is recommended by several good men for scarlet fever, measles, broncho-pneumonia and a dozen other infections.

Recognizing gastro-enteric infection in children to be more easily prevented than cured, the claims of Drs. Flexner and Hurd, if correct, will simplify the treatment of some of these disorders. "Since the bacillus of cholera infantum (possibly the bacillus of ileocolitis intended) has proven to be identical with that of dysentery," (Shiga bacillus), the disease must yield to the same antitoxin; and this new serum is advanced to such a state of perfection that the promotors unhesitatingly announce that its use directly destroys the germs in the blood, and a recovery is a scientific certainty in uncomplicated cases.

Measles (Weisbecker) and pertussis (Welch) have been shown to be amenable to serum injection obtained from recovered cases. Silvestri used the serum of convalescence from whooping-cough in seven cases of the disease. From 15 to 20 c.c. of the serum was injected in each. All were relieved, and in but two had the injection to be repeated.

The usefulness of guaiacol or creosote carbonate has been demonstrated in numerous instances of pneumonia in children. Potassium guaiacol sulphonate is claimed to have a specific action in this disease, bringing about a crisis in from twenty-four to seventy-two hours, and making the use of anti-

pyretics unnecessary. In Dr. Barnes' opinion, large doses of quinine, for its effect upon the leucocytes, and hot mustard baths, for equalizing the circulation, are indicated in the first stage of all pneumoniæ. However, infants occasionally suffer more from the vigorous medication than they do from the disease. In lobar pneumonia the treatment is simplified, the disease being self-limiting; the main object being to support the strength by suitable food. Breast-feeding babies can be continued at the breast, but bottle-fed babies should have further diluted or predigested food. Water is all the antiypretic needed, although the cold plunge should never be used. Cough and restlessness can be controlled by Dover's powder or salicylacetal. Alcohol, in small doses, may be given for its sedative effect, and strychnine is the only stimulant to be depended upon For collapse, which should be avoided, the hot mustard bath and vigorous rubbing is of greatest value.

Lumbar puncture has become a valuable therapeutic as well as a diagnostic measure. In the various forms of meningitis this procedure is of the greatest value in relieving pressure symptoms. Rotch mentions a case where the fluid was allowed to drain off and the child became brighter immediately, and eventually recovered. Griffith reports temporary relief in tuberculous meningitis, while Golden reports the complete recovery of a tuberculous meningitis after the withdrawal of 14 c.c. of cerebro-spinal fluid. Warrington reports three cases with two deaths. The *Diplococcus intracellularis* was present in one of the fatal cases and the *Staphylococcus albus* in the other. Babinski reports an interesting case in a girl, twelve years old, who completely recovered, with exception of deafness, after three lumbar punctures, and six months after the last operation there had been no return of the symptoms.

FIFTH ANNUAL MEETING, HELD AT THE ACADEMY OF MEDICINE, NEW YORK,

New York, June 2, 3 and 4.

Thursday, June 2.

The Address of Welcome was by DR. R. W. WILCOX, Chairman of Committee of Arrangements.

The Presidential Address on

RECENT ADVANCES IN MEDICAL THERAPEUTICS

was delivered by DR. H. H. BARKER, Washington. He recognized the fact, he said, that in thus honoring him the Society had again given expression to its appreciation of the services rendered by the Washington members in its behalf. Having congratulated the Society upon the success which had so far crowned its labors, as well as upon the brilliant future which now seemed assured, he said that, owing to its greatly broadened field of work, the Society appeared to have outgrown the possibility of a strict compliance with the rule requiring the President in his address at the annual meeting to review the progress of therapeutics for the preceding twelve months. While, however, the plan, gradually adopted, was now firmly established, of dividing Therapeutics into its special branches and of assigning each branch to some member of acknowledged authority in that branch, he thought the spirit of the law could be complied with, even if the President did not limit himself to a mere compilation of facts and figures in regard to the effects of remedies and methods of treatment. For instance, if he believed that there might have been greater advances in therapeutics but for certain obstructions placed in the way, and if he could point out the obstructions and ask

for earnest efforts in the attempt to remove them, he believed he would be working in harmony with the law, even if he did not comply strictly with the letter.

The first obstacle to the advancement of therapeutics to which he called attention was the prevalence of nostrums and proprietary remedies and their exploitation by the secular and religious press, the medical journals, and especially and most humiliatingly, by the members of our own profession. So outrageous has the advertising of these preparations become that even some of the better classes of the lay press are protesting against them, and protesting more consistently than are our medical journals; for, while many of the former are refusing such advertisements, several of the latter, while containing the most ethical voluntary articles and editorials against them in their reading pages, still carry them in their advertising columns and sometimes also in their reading matter. That the evil effects of the increased consumption of such nostrums as the result of these advertisements are coming to be realized by the laity is evidenced by some recent articles in the newspapers and a few non-medical magazines. Thus, recent numbers of the Ladies' Home Journal have contained articles condemning in emphatic terms this great evil, and in McClure's Magazine for April, 1904, in an article entitled "Enemies of the Republic," Lincoln Steffens exposes many fraudulent business methods. The author devotes considerable space to the advertisements of a Baking Powder Company. He produces a copy of its contract with newspapers, in which it is agreed to publish as news matter anything this firm may furnish, and quotes as a result a long and pathetic article relating to the poisoning of a family by an alum baking powder. Since the last meeting of this Society the following statement has appeared in a pamphlet advertising Terraline: "Refined, purified petroleum should be more extensively employed as a therapeutic agent; the reasons for its use should be more widely communicated to the profession at large.—*Official Report of the American Therapeutic Society at its Second Annual Meeting held at Washington, May, 1900.*" "I have laid this matter," said Dr. Barker, "before the Judicial

Council and asked them to report upon it as this meeting. It is earnestly to be hoped that you will most emphatically stamp this falsehood with your condemnation, and, giving all possible publicity to the fact, thus relieve yourselves of the odium cast upon you, which must, if not removed, act to the detriment of your standing among other Associations." The sentiment against these advertisements in the medical journals is growing in the profession, as is evidenced by some recent articles in the Journals.

So-called "patent-medicines" are not patented. The law does not permit the issue of patents for them, but they do obtain the protection of the law by their copyrighted labels. Many of the so-called "proprietary medicines" are however, patented under the law which provides for the granting of patents in the United States and England, alone of all civilized nations, not only for the chemical process by which a new product is obtained but for the product itself. It is a humiliating fact, but one which cannot be avoided under the present law, that we must, if we wish to use it, prescribe such a product under its patented commercial name. But it is positively disgraceful for us to prescribe, and much more so to recommend over our signatures in medical publications, the nostrums usually designated as patent medicines. The laws of the United States in regard to both copyrighted labels and patented chemical products are more liberal to the manufacturers and more unjust to the people than those of any other country, with the possible exception of England. A synopsis of the patent laws of twenty-three nations in regard to these preparations shows that in only two, the United States and England, are patents allowed. Partly in view of the fact that most of these products have been patented in the United States by chemists who are citizens of other countries, President Roosevelt in his last annual message to Congress said: "In granting patents to foreigners the proper course for this country to follow is to give the same advantages to foreigners here that the countries in which these foreigners dwell extend in return to our citizens; that is, to extend the benefits of our patent laws on inventions and the like, where in return the articles

would be patentable in the foreign countries concerned—where an American could get a corresponding patent in such countries." In order to secure legislation to this effect the National Retail Druggists had introduced into Congress a bill which was favorably reported by the Committee on Patents, but which, owing to the early adjournment, went over to the next session. As an illustration of the effects of this law the commercial aspects of phenacetine were referred to.

Another obstacle to the advancement of therapeutics is found in the growing evil of all forms of quackery. It is a fact that quacks have multiplied, *pari pasu* with the adoption of medical practice acts, and probably in consequence of them. It is singular that all such acts have been so loosely drawn as to be capable of being construed as merely prohibiting the use of drugs, or that courts who place this construction upon them are so alarmingly ignorant of the true meaning of the term practice of medicine. Many court decisions so construing these laws have been recently published, and two of them were cited. "The reasons of the Committee of the Medical Society of the State of New York why osteopathy and other peculiar methods of treating diseases should not receive special privileges" constitute an argument not only conclusive, but unanswerable, of the fact that all who claim to treat disease in any manner or by any method should be required to comply with the law. If this article could be laid before every court called upon to pass upon this subject, it seemed to the writer that it would carry conviction to every fair minded and honest judge. He believed that the way of removing these obstacles was to be found in united effort upon the part of the medical profession.

If it is possible to prevent these abuses by united action how can such action be secured? By education: Teach physicians that it is dishonorable to themselves and to our profession and dangerous to their patients to use nostrums. Teach the people the dangerous effects of the taking of nostrums and the treatment by quacks. And teach the courts that the practice of medicine means the prevention and treatment of disease by any and every means. These reforms cannot be accom-

plished immediately. It will take time and perhaps a long time. In the meantime new men will be entering our profession from the various medical schools. How much could be gained if these men could come to us thoroughly impressed with the importance and dignity of scientific therapeutics. Begin to teach them in the school. Change the methods now employed. They are now required to learn and are expected to remember all about hundreds of preparations when they will really use but few of them. It is utterly beyond the power of the human mind to accomplish this. What is the result? When the student leaves college and begins the practice of medicine he is often at a loss to know how or what to prescribe. No wonder then that he so often adopts some ready-made prescription he has seen advertised in his medical journal. If he were taught all that is possible to know about the few valuable remedies—if he were made to investigate for himself—and if clinical teaching and therapeutics went hand in hand, he would learn that therapeutics is something more than the prescribing haphazard some ready-made preparation he has been told will relieve some of the symptoms he finds present. If by such means the people should be taught the harmfulness of quackery, the profession united in an effort to suppress nostrums and quacks, and the courts fully informed in regard to the practice of medicine, what method should then be adopted?

First. Discourage the advertisement of patent and proprietary medicines in the medical journals by withdrawing our support from such as persist in accepting them.

Second. Have such changes made in our patent and copyright laws as may be necessary to deprive such preparations of the protection of the law.

Third. Secure the adoption and insist upon the enforcement of just and uniform medical practice acts throughout the United States. And see to it that the phraseology of such laws is so plain as not to be susceptible of doubt in its construction.

As to who should take the initiative in such matters, no body of men is so competent as the American Therapeutic So-

ciety. The concluding portion of the address was devoted to some recent advances, principally as regards the early recognition and treatment of pulmonary tuberculosis. Among the points noted were the following:

John M. Swan reports very exhaustive blood counts made by him in accordance with the classification of Grawitz. Laignal-Lavastine, Bonchacourt, Béclere, Landouzy, Williams and Dally have shown that radioscopy of the thorax enables us to detect tuberculosis in its very earliest stages, even before any evidence can be obtained by inspection, palpation, auscultation or percussion. This is shown by a diminution of transparency of the affected portion of the lung and the unilateral limitation of the movements of the diaphragm. Tuberculin as an aid to diagnosis is not always reliable. Trudeau says that while this test is reliable in most cases, thirty per cent. are latent tuberculous cases and do not give any signs or symptoms. J. D. Madison says patients may react to tuberculin, and still no evidences of tuberculosis be found in autopsy. Otis reports sixty cases of syphilis all of which reacted to the tuberculin test. Tubercular bacilli are not always readily found. All insist upon the importance of frequent attempts to find them. Much light will be thrown upon diagnosis by consideration of the causes and mode of infection. Salmon says that 25 per cent. of cases in children, as investigated by the German Commission, and 50 per cent. of the cases investigated by De Schweinitz, showed that they were by animal infection. J. O. Cobb says bovine tuberculosis may be transmitted to man, and he believes that a frequent mode of conveying the germ is by the common house-fly. Flick says the most striking feature about the communicability of tuberculosis is that it depends almost entirely upon the house. By house he means the home, the workshop, the school, and other enclosures where numbers of people remain in contact for a long time.

From what has been said as to the mode of infection of tuberculosis we might hope that if patients who suffer from this disease could be promptly separated from persons not so affected, and kept so separated during the entire course of the disease, and if in addition bovine tuberculosis could be eradi-

cated, the prophylactic treatment would be so effective that the disease could be readily stamped out. The most successful modern curative treatment is only a more thorough and scientific method of that recommended by Hippocrates, that anæmic patients with cough and loss of appetite and flesh should go to the mountains, live in the air and sunshine, and be fed upon bountiful diet, such as milk, eggs, etc.

Although Dr. Solis Cohen is a fervent advocate of the fresh air treatment at home, it is often impossible to carry out this treatment in cities, especially among the poorer classes. Suitably located, thoroughly equipped, and efficiently conducted sanataria afford the surest means for such treatment. A number of efforts have been made to procure a serum both for immunizing and for curative purposes. A close study of his statistics does not seem to justify the enthusiasm of Maragliano for his serum, prepared by a mixture of the bacilli and their toxin. Marmorek's report of successes with his serum is discredited by his former colleagues of the Pasteur Institute, but, on the other hand, Klein, Jacobson and Neill report cases apparently cured by it. Maher states that he has injected with good results the live bacilli, but does not give any figures. Friedman claims to have immunized guinea pigs and other animals by injecting cultures obtained from a tuberculous turtle. Foss has used antistreptococcic serum in 30 mixed cases, with excellent results. Menary, Jesse, Bogle, Campbell, Scriber, Stroud and Cornick also claim similar results from this serum. Moeller is still experimenting with his acid-fast bacilli, and expresses the hope that it may be possible to produce immunity by some of these relatively harmless bacilli.

Inquiries among druggists and agents in regard to antitoxin serum show that while there is a universal demand for diphtheria antitoxin and some for antistreptococcic serum, none of the others are used to any appreciable extent. Of the glandular extracts there is a great demand for that of the supra-renal gland and considerable for that of the thyroid. While Dr. Osborne considers the effects of thyroid extract as antagonistic to those of adrenalin, each has been used successfully in similar as well as in diametrically opposite conditions. Dr.

Satterthwaite reports a case of Graves' disease cured by thyroid extract. During the past two years Dr. Barker has treated three cases. Two of them, mild cases, are well. The third, a severe case, has, after four months of treatment, shown very considerable improvement, but he is skeptical as to the cure of the patient. Adrenalin has been used successfully in all branches of medicine. Dr. Mann, at the meeting of this Society two years ago referred to its use in gynecology and said it seemed to be a real and valuable addition to our Materia Medica. While there have been several reports of the successful treatment of uterine inflammation, especially of those attended with hemorrhage, Dr. Barker has not seen any reference to its use in cancer of the uterus. At that meeting he reported two cases of inoperable uterine cancer in which he had been using adrenalin with very beneficial results.

SYMPOSIUM:

RECENT ADVANCES IN ANESTHESIA.

The introductory paper was read by DR. R. W. WILCOX, New York. More than half a century, he said, has elapsed since William T. G. Morton publicly demonstrated that insensibility to pain could be safely produced. The operation on Gilbert Abbott performed at the Massachusetts General Hospital by John Collins Warren, on Friday, October 16, 1846, during insensibility produced by inhalation of ether administered by Morton, was an achievement of the greatest importance to the healing art, to its practioners, and to the world at large. Not only was Boston the *locus* of the discovery and the demonstration, but there the name was given, for Oliver Wendell Holmes proposed *anæsthesia* as a fitting term to designate the condition of artificial insensibility to pain. Until that memorable October day, no discovery in the science of therapeutics stands in bold relief: since then, asepsis alone is of importance comparable to the boon given to the world by Morton. Asepsis was a necessary corollary to anesthesia, but

lacking the latter, we would lack all. With the name of Lister, the Scotch surgeon, we must always join that of Morton, the American medical student; but without what Morton gave us, the work of Lister would have been of far less importance. During the fifty-eight years which have elapsed many substances have been proposed as a substitute for ether; most have had an ephemeral vogue, others have to some extent survived the stage of experiment. Later came various methods of local anesthesia, some of doubtful safety and questionable utility, while others offer encouragement as to their usefulness.

In the rapid invasion of many hitherto presumably non-surgical fields, in the increasing use of anesthesia for purposes of diagnosis, in the more frequent employment of mechanical methods for speedier results, the importance of this subject of this symposium has increased beyond what our medical fathers might have imagined. Therefore, it would seem that the time has arrived when, with a half century behind us, with conscientious laboratory experiment and intelligent clinical observation, and with an enormous literature, we are in a position to make definite statements as to the safety, contra-indications, limitations, range of adaptability and, especially, practicability of any substance or method which has been presented. Farther than this, and in consonance with the title, definite statements may now be made more particularly as to the "Recent Advances in Anesthesia." There are some points which should be insisted upon:—

1. Of what avail are the enormous number of facts ascertained in the laboratory, clinic, and hospital, and recorded in the journals, monographs and text-books, if the future anæsthetist is not to receive careful, exact and extended instruction in the principles deduced from these facts?

2. While the best preparation for anesthesia is the selection of a competent anæsthetist, has not the consideration of the patient as a subject for anæsthesia received too little attention? All the physiological systems should be interrogated, for upon their activity may depend not only the ultimate recovery of the patient, but even recovery from the immediate effects of this profound artificial insensibility. The respira-

tory, circulatory and urinary systems call for careful study, not only as to choice of anesthetic, but as well in establishing methods of preventing ill-effects from the anesthetic employed.

3. Is it not too frequently the case that deaths not apparently intimately associated with anesthesia have been ascribed to other causes, when a more careful study would have developed a causal relationship?

4. Has not the widespread use of general anesthesia resulted in higher death-rate than is inseparable from its employment? The statement has been made on several occasions that the proportionate number of deaths to anesthetizations, instead of decreasing, has rather been increased. If this statement is true, the care of the patient during the time that he is unable to care for himself is imperative. This means protection from cold, moisture, exposure, and the avoidance of unsuitable postures. Especially the slower rate of operating has resulted in detriment to the patient.

5. Finally, the operating room is no place for lectures upon either the patient or the operation. An anesthetic has been defined as an agent by which the patient is carried to the edge of death and held there while the surgeon does his work. Is further comment necessary?

General Anesthesia.—At the outset it must be borne in mind that all substances employed for this purpose are poisons; some, however, to a less degree than others. Ether is probably immediately fatal once in ten thousand, chloroform once in two thousand administrations. The final results are incapable of exact tabulation, quite likely to the advantage of chloroform. There is then a risk in every instance of general anesthesia which cannot be estimated beforehand, either as to immediate or remote consequences. Of mixtures, whether alcohol, 1; chloroform, 2; ether, 3, of our British colleagues, or chloroform, 1; ether, 6, of our Vienna days, or ether, 1; alcohol, 1; chloroform, 3; of our old master, Billroth, the rate of relative evaporation is doubtless modified by the mixture, and the total effect is not one of a single rate of diffusion, but a succession of volitilizations, varying according to the boiling points of the substances used. From his own observation Dr.

Wilcox would have none of them, but would adhere to either ether or chloroform, making his choice according to the individual patient. Having described the compound proposed by Meyer, on the suggestion of Weidig, made by the addition of ethyl chloride to the molecular solution of ether and chloroform, he said that sufficient clinical proof has not yet been advanced as to its therapeutic value, and the suggestion that a preliminary hypodermatic injection of morphine may be required throws some doubt upon the efficiency of the method. Moreover, this substance presents the full danger of the A. C. E. mixture, besides the additional one of the respiratory symptoms, even toxic ones, of ethyl chloride.

As to untoward effects; chloroform, whose high boiling point permits only fractional elimination by the lungs, shows its most potent after-effects on the heart, kidneys and liver. Ether, with its lower boiling point, on inhalation distends the alveoli, and by increased intra-alveolar pressure opposes the elimination of carbon dioxide from the blood, and thus produces some degree of cyanosis, with the further result of salivation, bronchorrhea, and liability to secondary pneumonia. On the other hand, Kemp, from his laboratory experiments, shows quite conclusively that ether produces a special contraction of the renal arterioles, with consequent damaging effect on the renal secretory cells. This appears in mixtures in which ether is present as a constituent. Under these findings, ether is contra-indicated as an anesthetic if renal disease be present, and especially with albuminuria and a tendency to pulmonary œdema. Chloroform appears from his experiments to have no effect on the kidney. As for the heart, chloroform is depressing; ether is stimulating. In the A. C. E. mixture we have the chloroform-heart and the ether-kidney, that is, as Bigelow was accustomed to say, the disadvantage of both and the advantages of neither. So far as concerns the kidneys, nitrous oxide seems the least deleterious of all.

Local Anesthesia.—This should be further divided into (1) the Corning-Bier method, or intra-spinal anesthesia, and (2) the Hall (1884) method of direct injection of an anæsthetic into a nerve trunk. Of the Corning-Bier method, much has

been written of its success, which is in many instances indubitable, of its dangers, which are real, although the estimate of Mohr-Bielefeld is exaggerated,—and of its comparatively limited field, which is evident. The use of benzoylvinyldiacetonalkamin hydrochlorate has improved the record of this method and rendered its future more favorable. Cocaine for the second variety has long held a prominent position. An over-dose is by no means devoid of danger, and probably half a grain is the maximum for one operation. Inasmuch as anæmia, when it can be artificially produced, aids in the production and prolongation of local anesthesia, the addition of the vaso-constrictor element of the suprarenal gland, has been of decided advantage. The more recent additions to our list of local anesthetics, diethylglycoglpara-amido-orthooxybenzoic acid, methyl-ester hydrochloride, p-amidobenzoic acidethylester, or the compound of this with paraphenalsulphoric acid, have received insufficient clinical attention for a valid opinion to be presented. For local anesthesia by the infiltration method (Schleich-Braun) the use of the above-mentioned vaso-constrictor suprarenal substance, in combination with benzoylvinyldiacetonalkamin hydrochlorate, presents a real advance both in efficiency and safety.

The search for local anesthetics which offer greater stability and less toxicity than cocaine has gone on with unabated vigor. The derivatives of the acetonalkamin group have been noted above. Under the holocaine group should be mentioned the oldest p-die-thoxyethyl diphenylamidine, and guaiacolbenzylester, eugenolaceta calcium orthoguaiacol sulphonate, and finally methenyl-p-phenetidide. Of the acoins, hydrochlorides of these derivatives, one, di-p-disyl monophenetylquinidine, offers some hope of succeeding cocaine, because it possesses a minimum of poisonous action with a greater intensity of anesthesia. Necrosis, however, may follow the subcutaneous use of strong solutions.

Aside from the introduction of various chemical agents by cataphoresis for the production of anesthesia, the observations of Ledue are important. This observer showed that almost complete inhibition of the cerebral centers could be produced

instantaneously by a continuous current. Another modification of local anesthesia is that denominated by Gant as sterile water anesthesia. When the injection is locally confined for the time being, or the lesion is fairly superficial, this method is applicable, and to Gant are we indebted for a practical, safe and efficient method of producing local anesthesia, even if its field be somewhat limited.

DR. T. SOLLMANN, Cleveland, presented a paper on

RECENT EXPERIMENTAL WORK ON ANESTHESIA.

Theory of the Action of Volatile Liquid Anesthetics.—No important additions, he said, had been made to our knowledge of the underlying mechanism of the action of the indifferent narcotics—the inhalation anesthetics and the hydrocarbon hypnotics—since the extensive researches of H. Meyer and E. Overton. Both these investigators arrived independently at the conclusion that anesthesia is caused by the solution of the lipoid (fatty) constituents of the cells by the absorbed anesthetic. All fat solvents are anesthetic if they enter the cell; the anesthetic power is proportional to the factor: Solubility in lipoid divided by solubility in water. This varies in a definite manner with changes in the chemical composition, so that the relation of constitution to action is explained on this purely physical basis. The same concentration of the anesthetic in the serum provokes precisely and quantitatively the same effect in all classes of organisms and cells (excepting plants and some of the invertebrates); but the absorption of the anesthetic from the air into the blood varies with the temperature, so that a different concentration of anesthetic vapor is required in cold-blooded and in warm-blood animals. The concentration of ether in serum necessary for complete anesthesia is 1 to 400; of chloroform, 1 to 4,500 to 1 to 6,000.

The rapid recovery which occurs when the anesthetics are removed shows that the lipoids are not taken out of the cell,

but merely dissolve within the cell. It also shows that the permeability of the cell wall cannot be greatly altered, a conclusion which is confirmed directly by experiments on plant cells. The mechanism by which the solution of lipoids causes anesthesia is therefore not yet understood. The fact that a long-continued anesthesia leads to death—even when the concentration is kept perfectly constant—shows that there must be side actions which are not explained by Meyer and Overton's theory. It is possible that these may be avoided by the simultaneous use of several anesthetics. The anesthetic action itself is simply proportional to the sum of the actions of the anesthetics which are present in a mixture. The action of the alkaloidal narcotics cannot be explained on this theory.

Histological Changes Caused by Anesthetics.—The change in the Nissl granules which were described by C. C. Stewart as a consequence of acute alcohol narcosis, could not be reproduced by Haskins. Wright, however, finds a disappearance of Nissl corpuscles and shrinkage of the nerve cells after prolonged chloroform or ether anesthesia. Of other histological changes, Sollmann and Brown have described an acute vacuolar degeneration of the liver cells in rabbits poisoned by ethyl carbamate (doses above 0.6 gm. per kilo). This effect was not produced by chloral.

Dosage of Chloroform.—The British Special Chloroform Committee has been engaged particularly in studying the dosage of anesthetics with a view to increasing their safety. As a necessary preliminary, the methods of estimating chloroform in the air and in the blood had to be investigated. Harcourt keeps the blood fluid by the addition of urea, adds dilute sulphuric acid, and expels the chloroform by a current of air at 70 degrees C. The air is passed over incandescent platinum wire, which burns the chloroform to HCl, and this is estimated titrimetrically.

Inhaling Regulator.—To be able to regulate the concentration during anesthesia, Harcourt passed the air through a conical flask containing the chloroform. The same principle has been in use in laboratories, but Harcourt modifies it so as to introduce a certain amount of rather inaccurate graduation.

The apparatus is more convenient than most other forms of inhalers, and has proved satisfactory in clinical trials.

Concentration in the Inspired Air.—The committee concludes that 1 per cent. to 2 per cent. of chloroform in the air is sufficient for anesthesia, and that these proportions are quite safe; .5 per cent. does not produce unconsciousness; 5 per cent. is dangerous. (These are practically the conclusions of all the former investigators.)

Idiosyncrasy.—The committee considers that the vague expression, "idiosyncrasy," ought not to be accepted in explanation of a fatal accident if the method of administration involves considerable fluctuations of the quantity of chloroform absorbed per unit of time.

Effect of Chloroform on the Heart.—McWilliam showed that this drug has the same effect in the cat as in man. The heart is at first quickened, and then slowed. The acceleration is due to a depression of the vagus center, for it occurs after section of the accelerators, but not after section of the vagi. The subsequent slowing is partly due to a vagus stimulation, but mainly to direct depression of the cardiac muscle.

Sherrington and Sowton, who investigated the action on the excised heart of the cat, employing a method which reduces the heart to the simplest experimental conditions, obtained the following results: Chloroform does not much impair the excitability of the vagus or accelerator nerves, even when the heart muscle is profoundly depressed. The main effect is on the strength of the contractions, the rate being but little altered; the action is less on the auricles than on the ventricles. The effect reaches its maximum within a minute after beginning the perfusion, and does not increase if the drug is continued; there is consequently no cumulative action; on the contrary, the heart tends to recover somewhat. The absolute amount of chloroform which is passed through the heart is therefore quite immaterial; the action depending purely on the concentration. (This is precisely what has been observed in regard to all other tissues.) Very large doses stop the heart; death is preceded by fibrillation. If the chloroform solution is replaced by unpoisoned Ringer's fluid, the hearts recovers very

promptly and completely, unless the concentration has exceeded a certain maximum.

Tunnicliffe and Rosenheim, employing the same method, obtained the same results: 0.1 per cent. chloroform stopping the heart is diastole. Ether, alcohol, and acetone had very little effect even when perfused in a concentration of 0.2 per cent. O. Loeb also found similar results with a similar method. Chloroform stopped the heart in a concentration of 0.084 per cent.; and greatly weakened it in 0.056 per cent. Ether, on the other hand, had but a temporary effect in 0.13 per cent.; and 0.399 per cent. was required to stop the heart. Large doses of ether also dilated the coronary vessels. Alcohol was almost ineffective; even 2 per cent. had practically no action.

Effect on Vasomotor System.—Blauel investigated this by Gaertner's tonomanometer, and found a radical difference between ether and chloroform. Ether has a tendency to raise the blood-pressure, while chloroform always causes a progressive lowering. This is often accompanied by sudden falls, which may occur even after the administration of chloroform has been stopped. This is, therefore, an especially dangerous feature. No explanation of the phenomenon is given.

Resuscitation of the Heart.—Since the stoppage of the heart is, doubtless, the most refractory phase of the accidents of anesthesia, the advances which have been made in this connection deserve notice. An active massage of the heart, together with artificial respiration, forms the basis of all the newer methods. Prus claims to have revived a dog's heart as long as one hour after asphyxial death, by massage of the exposed heart with saline injections. He also claims success in chloroform death. Bourcart also claims revival of the dog's heart 15 minutes after death by diaphragmatic massage of the heart. Crile increases the efficiency of the massage (through intact thorax) by intravenous injections of saline solutions and suprarenal alkaloid. In the majority of these resuscitation experiments, success is certain only if treatment is begun very soon after apparent death; in fact, when the heart is still feebly beating. It is also very doubtful whether they are at all effective in severe chloroform poisoning, since Sherrington and Sowton

could not revive the heart after an overdose of chloroform. The demonstration of Locke that the mammalian heart could be made to beat for many hours outside of the body, if the coronary vessels were perfused with a suitable solution, justified the hope that the "dead" heart could be made to beat again. This was confirmed by Kuliabko, who succeeded in reviving a rabbit's heart which had been excised 44 hours. D'Halluin has also revived a child's heart which had been kept for 36 hours after being excised, without especial precautions. Rigor had set in. In all these experiments, the heart was used after excision from the body. It seemed to the writer interesting, from a practical as well as a theoretic standpoint, to attempt similar experiments on intact animals. For this purpose he clamped the aorta, and in some cases the vena cava, and injected a warm Locke's fluid under a pressure of oxygen into the cardiac end of the carotid artery, the other carotid being connected with the manometer. It was not difficult to keep up what should be a sufficient blood-pressure (100 mm. Hg.) by this method; but the heart did not resume its beat even when the perfusion was started as early as 15 minutes after death. The cause of this failure was found to be intracardiac clotting. If the same heart was opened, the clot removed, and the coronary vessels perfused by Langendorff's method, a good beat could be obtained. This would indicate that the clotting does not involve the coronary arteries. A definite limit is therefore set to all attempts to revive the heart in situ, by the formation of clots in the cardiac cavities. This event occurs in dogs quite early after the stoppage of the heart; it was present in two out of three animals opened, 20 minutes after asphyxial stoppage of the heart. As the ordinary methods of resuscitation are successful in this early period after death, he considered it superfluous to continue his experiments. The resuts give rise to some doubts whether the heart had really stopped in the cases of late revival which have been reported. Kuliabko quotes some cases in which the dog's heart beat 92.5 hours after death; these post-mortem pulsations are often so weak that they could readily escape notice unless the chest were opened. In conclusion, it would seem that resuscitation

of the heart should be attempted persistently in every case of death by asphyxia or anesthetics; but that we should not be surprised at a failure if considerable time has elapsed, or if a large overdose of chloroform has been used.

Other Treatment of Accidents of Anesthesia.—H. D. Haskins finds that fairly strong therapeutic doses of strychnine counteract the respiratory and motor depression produced by large doses of alcohol, without lessening its anesthetic qualities; should this be found to hold for other anesthetics, strychnine would be a useful preliminary adjunct to every anesthesia.

The Gases in the Blood in Anesthesia.—Livon has found that ethyl chloride, like chloroform, lowers the CO_2 and increases the O of the blood. Ethyl bromide and nitrous oxide have the same effect. Croton chloral and chloralose produce the opposite result.

Late Effects of Anesthetics.—Munro concludes that the belief that ether is more irritant to the kidneys than chloroform is not based upon sufficient evidence; and that the existence of albuminuria and casts is not in itself sufficient to condemn the use of ether. Hawk finds that prolonged ether anesthesia (a half to four and a half hours) on dogs in nitrogen equilibrium, was followed by a slight diuresis, with a small increase of nitrogen excretion, and a considerably increased chloride excretion and glycosuria. The blood showed an increased number of red corpuscles (agreeing with the observations of DaCosta and Kalteyer, who refer it to a diminished amount of plasma); the leukocytes were also increased. Starved dogs showed the diuresis, but no glycosuria. The effect on the blood was the same.

Lowering of Resistance.—Snel found that anesthesia lowers the bactericidal power of the tissues and body fluids very greatly; but this is quickly recovered when the anesthetic is stopped. Morphine does not have this effect. He believes that the lowered bactericidal power of the lungs is an important factor in the pneumonia following operations.

Operations in the Excitement State of Ether.—This method has again been recommended as less dangerous than the ordinary anesthesia. Ether is inhaled until counting becomes ir-

regular. The advocates of this method insist, however, that special precautions are essential.

Administration of Chloroform with Oxygen.—H. Wohlgemuth claims that this diminishes the danger of the anesthesia very materially. A special apparatus is required. Roth shows that the oxygen does not decompose the chloroform.

Other Liquid Inhalation Anesthetics.—Ethyl chloride and ethyl bromide have recently found some favor, especially for rapid operations (tonsillotomy, etc.). It is claimed that they produce less excitement and vomiting, with rapid recovery. Their safety is, however, questionable. The muscular relaxation is also incomplete. Ethyl chloride may find a limited use as a preliminary to the administration of the other anesthetics, but this field has already been occupied by nitrous oxide. The endorsements of the latter method only continue to increase. Morris concludes that it reduces the required amount of ether to three-fourths.

Other narcotics are also endorsed for this purpose. Fodera and Bugatti recommend methylpropylcarbonal urethane, ethyl carbamate and sulphonal (in this order of preference) to lessen salivation and vomiting, and to render the anesthesia more lasting. Schneiderlin's method has also led to a revival of the use of morphine and atropine (or hyoscine) for this purpose. This can only be approved, for these alkaloids support the desired action of the inhalation anesthetics, but not their undesirable side actions. Some of the latter are even counteracted.

Mixtures of Gaseous Anesthetics.—The various mixtures have found considerable employment, under the theory that the dangerous effects of both anesthetics are thereby lessened; but the clinical results have not corresponded with the earlier expectations. It would be a considerable gain if we could produce by such mixtures an anesthetic which would be not quite as violent as chloroform, and not as slow as ether. This result may be actually attained, but the mixed anesthetic is perhaps even more dangerous than pure chloroform. This is due to the fact that the composition of the anesthetic vapor is not at all the same as that of the anesthetic itself. Ellis showed, as

early as 1886, that the more volatile anesthetic evaporates first from a mixture, and this has been confirmed by the careful experiments of Kochmann. Accordingly, if a mixture of ether and chloroform is inhaled, the first effect will practically be that of ether, the later effect that of chloroform; and no means exist for knowing which anesthetic is being inhaled at a given point. This may be avoided by mixing the vapors in definite proportions, involving the use of apparatus too cumbersome to be practical. But even then, there is no guarantee that the proportion of the anesthetics in the blood corresponds to that in the vapor. Schleich introduced a new idea into this subject of mixed anesthesia, namely, that the retention of the anesthetic in the body depends on its boiling point. He suggested the use of mixtures of chloroform, ether, and petroleum ether, with boiling points of 38 degrees C. to 42 degrees C. as the ideal anesthetics. The clinical results, however, with either Schleich's mixture or Meyer's (chloroform, ether and ethyl chloride) are very unsatisfactory, and probably little can be hoped for from such anesthetic mixtures.

Carbon Dioxide Asphyxia.—This is one of the earliest methods of producing anesthesia, and it is often an accessory factor in the administration of the ordinary anesthetics. Rothschild made some experiments with carbonic acid gas and found it unsuitable, because of the great danger of a fatal asphyxia. He also saw it followed by toxic nephritis.

Scopolamine-Morphine-Anesthesia.—Schneiderlin published in 1900 a method of anesthesia consisting in the hypodermatic injection of a mixture of morphine and scopolamine. He claimed to produce by this a complete insensibility to pain, with a minimum discomfort to the patient. The mixture was found more effective than either alkaloid alone, even in double the dose. Schneiderlin's method has received quite extensive trials, especially by Korff, who somewhat modifies the dose. While there can be no doubt that the method is effective in the majority of cases, some patients are not completely anesthetized. The clinical reports soon brought to light other inconveniences (postoperative vomiting) and in a number of cases grave symptoms of morphine poisoning. As has been pointed

out in an editorial in the *Therapeutic Review,* Schneiderlin's opinion that the two alkaloids counteract the dangerous effects of each other, is not based on any evidence. The known facts indicate rather that they are synergistic in their depressant effects. The statement that the anesthesia is much more complete than when etiher is used alone in large doses is also in need of confirmation. All attempts to introduce an anesthetic acting in a fixed dose appear to the writer to be a step backward, since they lose the great advantage of the volatile and local anesthetics, viz.: The ability to adjust the anesthesia to the needs of the moment. The principle of Schneiderlin's anesthesia could be useful only in those cases (if they exist) in which inhalation or local anesthesia is inapplicable. A better use has been made of this method by employing smaller doses as a preliminary to ether anesthesia. Kochmann recommends 0.5 mg. of scopolamine with 10 mg. of morphine; Robertson gives 0.6 mg. of scopolamine a half hour before the ether.

The conclusion of the paper was devoted to a brief consideration of local anesthetics.

GENERAL ANESTHESIA.

was assigned to Dr. M. F. Thompson, Washington. He gave a sketch of the history of anesthetics, and incidentally quoted the descriptions given by Copeland of a patient undergoing an operation without an anesthetic and of a similar case under anesthesia. Of the various theories which have been advanced as to the *modus operandi* of general anesthetics, no *one,* he said, has as yet been demonstrated to account exactly for the complete loss of sensation and mentality. Ether still holds the highest rank as a general anesthetic. The administration of chloroform should always be watched with the greatest care, on account of the danger to the heart. This anesthetic is still much used in obstetrics, though it may possibly be followed by hemorrhage or the death of the child, and is liable to render the mother unable to help the delivery of the shoulders after the head is born. When any general anesthetic is used in labor, pains have been noticed to drop off, especially if it has

been started before the end of the first stage. Chloroform is in favor for short operations in children; but for prolonged operations it is safer to substitute ether for chloroform as soon as loss of sensation occurs. For minor operations, nitrous oxide gas as administered to-day is an ideal anesthetic. The compactness of the gas as now furnished makes its use much more convenient than formerly. The gas-ether sequence is an excellent method in experienced hands, and appears likely to grow in favor. With the inexperienced, however, it is not satisfactory, and Dr. Thompson's preference personally is for ether alone or gas alone. In 1902 McCardie reported on the satisfactory use of ethyl chloride in over 600 cases. He asserts that this agent possesses all the requisites of a perfect anesthetic, and that it is the safest of all anesthetics except nitrous oxide gas. Seitz records 16,000 cases with only one death, and that in a very unfavorable subject; and Soulier, 8,000 cases, with no death. Von Necken uses ethyl chloride whenever it does not seem safe to employ ether or chloroform, as in high degrees of circulatory interruption, fatty degeneration of the heart, disease of the respiratory organs, nervous shock, and enfeeblement from great loss of blood.

DISCUSSION: THE HISTORY OF ETHER ANESTHESIA.

DR. W. J. MORTON, New York, said he would like to ask the indulgence of the Society for a moment, as a matter of justice to his father's memory. Dr. Thompson had spoken of Wells as the discoverer of anesthesia. The true history of ether anesthesia had yet to be written. So much that was incorrect had been told and accepted as true that he wished the profession could know the authentic history of the discovery and institution of ether anesthesia as it was now known to him. The whole matter had been clouded by unfortunate controversy, which had lasted for many years. Dr. Morton was sometimes spoken of exclusively as a dentist. He practiced dentistry for three years in order to make a living, while pursuing his studies at the Harvard Medical School. It was at the end of his second year at that school that the discovery of ether anesthesia was made by him. With the pressure upon his time which immediately followed this, he never had the opportunity to complete his course there, but an honorary degree of M.D.

was conferred upon him afterwards (in 1853) by the Washington University of Baltimore, afterwards merged into the present College of Physicians and Surgeons in Baltimore. He was, therefore, a medical student of two years' standing, and a physician, as well as a dentist, and this brought him in closer touch with us. Horace Wells is stated to have discovered laughing gas anesthesia in 1844. His effort made no impression whatever. His anesthesia would not work and did not succeed until another method was adopted in 1863. Nothing was heard of it in the two years following. But in 1846 ether anesthesia went out to the world, and from that moment the world practiced anesthesia. The Wells discovery, whatever it was, took place, as has been said, in 1844. But whatever Wells accomplished with laughing gas had been accomplished better by Long, of Georgia, in 1842. What was the condition of affairs in 1845? In the medical literature of that time there is not a single case of anesthesia mentioned. What was the anesthesia of 1844? It was never published in any journal by Dr. Wells or any of his friends. It is undoubtedly the case that if artificial anesthesia had been discovered in 1844, it would have created an extraordinary sensation. Yet what Wells tried to do was passed over in silence. But when the practical demonstration of ether anesthesia went forth from the Massachusetts General Hospital in 1846, we did have this extraordinary sensation produced, and the new idea was adopted all over the civilized world. The scentific world is not concerned with the question, who discovered ether, or who discovered anesthesia? Anesthesia is simply a state or condition, produced by accidents or by drugs, and often unintentional. The real question is, who discovered ether anesthesia? Who put the matter on a practical basis, so that the medical world adopted the method as a recognized procedure? This honor belongs to Dr. Morton alone, who at the Massachusetts General Hospital, in the year 1846, gave the first public demonstration of ether anesthesia, and thus convinced the world of its practicability.

DR. THOMPSON said he had had no intention whatever to slight Dr. Morton and his discovery in the least. The very pen picture which he had quoted, illustrating the beneficent effects of anesthesia, had been written with that first demonstration of his in mind. He desired to give all possible credit to Dr. Morton.

LOCAL ANESTHESIA

This paper was read by DR. E. J. KIEPE, Buffalo. Cocaine and eucaine, he said, still hold first place. While the newer agents and methods offered from time to time usually possess some advantages over our older agents, they usually develop deficiencies when given the test of practical experience, which soon relegate them to the background. Either they are decidedly toxic or too irritating, or they do not possess penetrating powers. Thus the prominent series of complex chemical substances known as acoines, while presenting almost every advantage that one might wish for, are so irritant as to be caustic when injected into subcutaneous or subconjunctival tissues, even in solutions of a strength of 1 in 1,000 of normal salt solution. Acoine associated with cocaine, in the proportion of 1 to 11, has been recommended by Darier, but this combination, while very meritorious, is considered by many as still too irritating. Other agents, like orthoform, while possessing every advantage as anesthetics, including even an antiseptic action, are of little value on account of their insolubility in water or normal salt solution; for if a solution is effected by other means, their anesthetic properties are largely or entirely destroyed. To Réclus we are indebted for bringing to notice the fact that dilute solutions are as efficacious as stronger ones. He was the first to advise 1 per cent. solutions, and in exceptional instances, 2 per cent. Schleich also showed that strong solutions were not necessary, and that solutions as weak as 1 in 5,000 were anesthetic, although he was cognizant of the fact that the large amount of water used as a diluent had considerable influence in producing anesthesia of parts. Of the recent advances, probably the most notable and best substantiated is the fact that the active principle of the suprarenal gland is a potent factor in lessening hyperemia. It is also a synergist of no mean value. While adrenalin has no anesthetic properties whatever of its own, not only are the toxic effects of cocaine and eucaine markedly diminished, but the anesthetic effects of both are increased to a marked degree by it. Dr. Kiepe has observed anesthesia to last as long as twenty min-

utes, and others report thirty minutes and more. Local blood vessels are contracted by the direct action of the adrenalin upon their walls. They remain firmly constricted for a number of hours afterward, and thus any tendency toward congestion and consequent hemorrhage is diminished, while the pain which is always present after the anesthetic effects of cocaine or eucaine have worn off is relieved. It is well to note the fact that certain varieties of cocaine, especially tropacocaine (existing naturally in Javanese coca leaves), do not act satisfactorily when combined with adrenalin.

LOCAL ANESTHESIA BY CATAPHORESIS AND BY PRESSURE ANESTHESIA

DR. W. J. MORTON, New York, read a paper on this topic. Cataphoresis, he said, implies that medicaments may, by electric pressure or voltage, be caused to penetrate the sound skin or mucous membrane, and thus exert their characteristic effects. If these medicaments have anesthetic or analgesic properties, we have then established a local anesthesia or analgesia. As the penetration of the skin may begin at either pole, we must speak of an anaphoresis; for this reason he has suggested calling the entire process electric medicamental diffusion. In his own practice he uses electro-cocaine-guaiacol local anesthesia in a great variety of minor surgical operations. The term "pressure anesthesia" was invented by Dr. Morton in 1897 to define a new method of local anesthesia presented by him at that time. This method was based on the idea that medicamental solutions, especially anesthetizing ones, might be forced into the tissues by the pressure of vapors or gases or by mechanical pressure. Pressure anesthesia has now become well nigh universal in dental practice. To a strong solution of cocaine in guaiacol is added an equal amount of ether, and when this is introduced on cotton within a tooth cavity, and the cavity is closed with a soft rubber stopping, the evaporation of the ether (and probably also the mechanical pressure of forcing in the stopping) forces the anesthetizing solution into the sensitive tissue of the tooth cavity. In the practice of pressure anesthesia in minor surgery Dr. Morton has frequently made use of a cupping glass, a watch glass, or a test tube, in which to allow the evaporation to take place.

DR. S. G. GANT, New York, read a paper on

STERILE WATER ANESTHESIA.

A local anesthetic, he said, which would prove effective in operations about the ano-rectal region and at the same time be devoid of toxic properties, would enable the surgeon to perform most of these operations in his offce, and the writer has been experimenting for many years, in order to find one which would possess these advantages. Recent experiments have demonstrated that sterile water, properly injected, is a trustworthy local anesthetic, and, from experiments carried out in more than two hundred and fifty cases of rectal affections radically operated on by the writer, he is convinced that it is the most desirable local anesthetic in these operations, because it produces a sufficient degree of anesthesia, and in no instance has its employment been accompanied or followed by any of the annoying and dangerous complications which are frequently encountered when cocaine or similar drugs are used. Having referred to the work in local anesthesia of Yeo, Griffith, Feinberg, Corning, Réclus, Oberst, Schleich and Halstead, he said that few if any cases have been reported where operations have been performed in any part of the body under local anesthesia induced by the injection of sterile water into and beneath the skin. The writer, assisted by Dr. Edward Preble, has thus far been unable to find any reported cases where this method of producing local anesthesia has been employed in operations about the rectum and anus. It occurred to Dr. Gant to try distention of the tissues with water to produce local anesthetization, on observing (1) that cocaine, eucaine, and other solutions were practically inert when distention failed of being obtained because of the escape of the fluid through an ulcer, fissure, or sinus, although the same solutions were effective where no such opening existed and distention was accomplished; and (2) that very weak solutions of the same drugs were apparently as effective as strong solutions where complete distention of the tissues was possible. The experiments with sterile water anesthesia were begun in September,

1901, but only recently has the technic been so improved that the writer has used it to the exclusion of general and medicinal local anesthetics, with gratifying results, in practically all except capital operations. The cases in which the method has been successfully employed include radical operations for fissure, ulceration, protruding and non-protruding internal hemorrhoids, cutaneous and thrombotic external hemorrhoids, polypi, prolapsus ani, ordinary complete and blind internal and external fistulæ, and marginal and follicular abscesses; excision of perineal cysts, sacral dermoids, and lipomata of the buttocks; removal of foreign bodies beneath the skin and mucosa; division of the sphincter in constipation, where the muscle was so hypertrophied that divulsion had proved ineffective; fixation of an elongated sigmoid to the anterior abdominal wall; colostomy; and exploratory laparotomy.

The method of producing local anesthesia by the distention of the tissues with water is very simple. The only requirements are sterile water and a hypodermic syringe fitted with a long, fine, sharp-pointed needle, both of which should be carefully sterilized. The temperature of the water is unimportant, cold, warm, and hot water being equally effective in producing anesthesia; but the warm is preferable, as it causes the least discomfort. Again, sterile saline solution has been frequently tried, but it does not appear to possess any advantages over water.

The technic of injecting water varies, depending on the nature of the operation. When an incision is to be made through the skin and subcutaneous structures for fistula, colostomy, exploratory laparotomy, abdominal fixation of the sigmoid, excision of lipomata, dermoids, etc., or the removal of foreign bodies from beneath the integument, the procedure is as follows: A fold of the skin at one extremity of the line of incision is caught up between the thumb and forefinger and compressed for a few seconds, which diminishes, and often prevents, the momentary pain caused by the first injections. The needle is then quickly introduced between the layers of the skin, and a few drops of water are slowly injected. They should produce a small, localized distention not unlike a blister, and as soon

as it appears, anesthesia of the skin should instantly occur at this point. The needle is then inserted slowly further and further along the line of the cut to be made, and the water is gradually injected as before, care being taken not to go entirely through the skin. When the syringe is emptied it is refilled, the needle is reintroduced within the anesthetized area, and the injections are repeated as before, until the distention extends the entire length of the line of incision. The needle is then plunged through this distended line and subcutaneous injections are rapidly made until a firm, whitish, ridge-like swelling, about as wide and thick as the index finger is produced. These deep injections may cause a temporary discomfort due to the rapid distension of the subcutaneous tissues. If the procedure has been properly carried out, the skin and underlying tissues can now be incised without pain in almost every instance.

For external thrombotic hemorrhoids it is necessary to make the injection of sterile water only between the layers of the skin overlying the clot to be removed. In excising external cutaneous hemorrhoids, both the skin and tumors should be distended tightly, in order to obtain effective anesthesia. Large internal venous or capillary hemorrhoids can be anesthetized in less than thirty seconds by injecting directly into the center of each tumor sufficient sterile water to *distend it tightly and cause it to turn white.* They can then be removed painlessly by the ligature, clamp and cautery, or excision method. Fissure, fistulæ, ulceration, epithelioma, stricture, and congenital malformations about the anus, constipation, fæcal impaction, or other affections which require operation to increase the lumen of the anal outlet, or which necessitate incision or division of the sphincter muscle, may be operated on under water anesthesia. For these operations the skin and subcutaneous structures up to the anal margin are distended, as previously described, and, finally, injections are made into the mucosa, submucosa, the external and, if necessary, the internal sphincter muscle, until a sufficient degree of pressure is exerted upon the nerve endings to overcome sensation. The injection should be made slowly, as rapid distention of this sensitive region may

produce considerable discomfort. Follicular and marginal abscesses may be opened with but slight pain by injecting the water between the layers of the skin immediately over the abscess, subcutaneous distention being unnecessary. Ischio-rectal abscesses, if small, may be incised in the same way. Prolapsus ani of moderate degree may be almost painlessly operated on by first distending with the sterile water the areas of mucous membrane and muscular structures which are to be removed by the ligature or clamp or cautery, or by distending the lines of incision when a segment of the bowel is to be excised.

The advantages of water anesthesia are many:

(1) Effective local anesthesia is so quickly and easily obtained by this method, that in a majority of rectal operations and those in other parts of the body there is no necessity of requiring the patient to submit to the annoyance and expense of entering a hospital and undergoing general anesthesia.

(2) The anesthesia instantly follows the injection of water sufficient to distend tightly the tissues to be incised or removed. This enables the operator to work quickly and, as the patient is not confined to the hospital during the after treatment, but can come to the office to be dressed, it economizes the surgeon's time and labor.

(3) No annoying or dangerous complications have been observed during or following the injection of the amount of water necessary to produce anesthesia.

(4) In the writer's experience, the pain and bleeding following this method of local anesthetization have been less than when medicinal local anesthetics have been used.

(5) It eliminates the danger to life from heart, lung, and kidney complications, which are always to be feared during and following the administration of ether or chloroform, and it avoids the increased pain and hæmorrhage due to straining and vomiting after general anesthesia.

(6) The only requirements are a hypodermic syringe, a suitable needle, and boiled water, and these are usually at hand.

(7) The radical treatment of hemorrhoids can be so easily carried out under this method in the physician's office, with so

little danger and inconvenience to the patient, *that it should relegate to oblivion the much vaunted injection treatment,* which is so dangerous and uncertain.

This method of anesthetization is not practicable, however, for excision of the coccyx, or for extensive operations, such as are required for the removal of large tumors by excision or resection of the bowel, or for the relief of complete prolapsus recti, complex, horseshoe, rectovesical, recto-urethral, and rectovaginal fistulæ, very extensive abscesses and strictures, congenital malformations, or other affections located in the upper rectum. Neither is it applicable for opening the abdomen in some cases where there is a thick layer of fat and the tissues are so loose and flabby that a proper degree of distention is impossible.

The anæsthetization and *anaemia* of the part occurs almost instantly on complete distention of the tissues, and from this it would seem that it is apparently produced by the pressure upon the nerves and their endings, or upon the blood-vessels, caused by the pressure. If the distention is too rapidly induced, however, by too rapidly injecting the water, it may cause considerable temporary discomfort, amounting to pain in extremely sensitive persons. While anesthesia by the injection of sterile water is not effective and cannot be applied in all major operations, the writer has of late employed it to the exclusion of general and local medicinal anesthetics in nearly all his rectal operations (hemorrhoids, fistulæ, fissures, etc.), and with such gratifying results that he would heartily recommend its thorough trial by other surgeons for operations in the ano-rectal and other regions of the body.

At the conclusion of the paper Dr. Grant demonstrated his method very successfully on a severe case of prolapsus ani.

Friday, June 3.

SYMPOSIUM: THE COMBAT WITH INFECTION.

DR. T. E. SATTERTHWAITE, New York, read the introductory paper, entitled

SOME CONSIDERATIONS ON INFECTION AND IMMUNITY.

So far as we now know, he said, bacteria are the chief causes of disease, and the infecting bodies in tuberculosis, typhoid, glanders, gonorrhea, anthrax, tetanus, bubonic plague, suppuration, erysipelas, lobar pneumonia, influenza, diphtheria, ordinary dysentery, cholera and relapsing fever are believed to have been discovered, although they cannot all stand the test of Koch's well-known law. Of the list thus given, cultures of the bacteria of bubonic plague and glanders have on several occasions communicated these diseases to laboratory workers, and sometimes have caused death. In others, such as leprosy, there is doubt whether the bacillus has been successfully cultivated, certainly inoculation experiments have yielded uncertain results; while erysipelas appears to have no specific bacterium, and to be due rather to the *Streptococcus pyogenes,* one of the pus-producing bacteria. There is no doubt that the requirements of Koch's law are severe. It is one thing to see a successful development of the inoculated culture within the body of an animal, and another to reproduce the disease with its clinical signs. This latter requirement has been the great stumbling block for laboratory workers. There is also a strong presumption that the infecting agent is bacterial in syphilis, mumps, measles, whooping cough, typhus, hydrophobia, dengue, acute inflammatory rheumatism, and beri-beri, but the proof is still lacking, just as in yellow fever, scarlet fever and smallpox. Possibly some of these organisms are so minute that they cannot be differentiated by our present microscopes. Nor has the last word been said as to the morphology of the bacteria with which we have to do. But there is an-

other class of microcytes that are concerned in causing disease. These we call fungi. They are usually classed among the molds or yeast fungi. Of these a conspicuous example is actinomycosis, which causes the "big head" of cattle, and occasionally occurs in the human subject. The *Aspergillus niger* may also produce a disease of the external ear, or complicate a bronchial pneumonia, in which latter case it will be a secondary infection. These microcytes, which like the *Aspergillus* live on dead matter, are called saprophytes, and they are classed as facultative, if they have the inherent power of infection independent of contamination from sources outside of the body.

Evidently then, according to our present information there are three sources of infection. The most common appear to be bacteria, less often fungi; and least of all, protozoa, though the latter are certainly assuming a greater numerical importance. The discovery that bacteria may not cause infection directly was due to the study of the *bacterial* poisons called *ptomaines,* which could be easily isolated. For a ptomaine may be regarded as an organic chemical compound, toxic in character, formed by the action of bacteria on nitrogenous matter.

Now the poisonous effects produced by the inoculation of some of these ptomaines on animals led to the supposition that analogous substances formed by the specific bacteria of infective disease *might* account for their characteristic symptoms. But research has not determined the intimate nature of these bacterial products. We know they are poisonous and call them *toxins,* but their composition is unknown; in fact it has been found impossible to isolate them so completely as to establish their chemical characters. And yet they have been obobtained from the bacteria, not only of diphtheria and tetanus, but of other diseases. There is also some evidence to indicate that other specific bacteria elaborate poisonous products. In fact bacteria as a rule generate special poisons, though in typhoid fever and in cholera certainly, the poisons remain for the most part inside the bacterial bodies. From our present standpoint, the question of incubation offers few difficulties. At the beginning of an infective disease the infecting bacteria

are comparatively few in number, and their toxins small in quantity. But both develop proportionately, the elevation of temperature and constitutional symptoms keeping pace with their development. When enough poison has been generated, the disease manifests itself by characteristic signs. The time required for this purpose will depend on the quantity or virulence of the initial dose, and the resistance offered in the body. These circumstances may account for the variability of the duration of incubation. That it is even tolerably uniform in the various infections is quite remarkable. The term *contagion,* in the narrow sense, suggests that it should be limited to diseases communicated by direct animal contact. But even in the most virulent of them, such as gonorrhea, the contact may be mediate, rather than immediate; contaminated objects, such as soiled linen, serving as vehicles for spreading the disease. In yellow fever also the *Culex fasciata* appears to carry the poison, while the tsetse fly of the East, infected with the *Trypanosoma,* inoculates horses and other animals, and even man occasionally, producing the fatal "surra." Rats, and probably flies, ants and fleas are also the intermediate hosts of the plague germ. Evidently then, in these most characteristic contagious diseases, there is infection, and therefore they are infective. On the other hand, infective diseases may not be contagious. Epidemic cerebro-spinal meningitis is an example. It is infective, but not contagious in the ordinary sense; that is, it does not appear to be carried from person to person.

Infection, accordingly, may be mediate or intermediate, direct or indirect. Anthrax, typhoid, cholera and diphtheria can be propagated in either way; for typhoid and cholera can be transmitted through the media of water, directly from the excreta. Diphtheria can be communicated through the medium of milk, or by contact with an infected person. The possibility must be borne in mind, however, that these and the bacilli of typhoid may have a mycelial growth like the fungi; even that sometimes they may be facultative saprophytes, *i. e.,* that they can develop *de novo* in suitable dead material. In some affections, like tetanus and diphtheria, the pathogenic bacteria have only a local manifestation; in others, like an-

thrax, they may infect the blood throughout the system. The behavior of any animal toward an infection varies according to the species, the individual, or circumstances. It should also be borne in mind that there is apt to be a wide difference between the human disease and the experimental of animals, both as to symptoms and lesions. In tetanus, however, there is a marked resemblance between the human disease and the artificial of animals, even to the character of the spasms. On the other hand, in diseases such as anthrax, glanders, and foot and mouth disease, which occur both in men and animals, there is sometimes an extraordinary similarity in the symptoms; but they are never alike. It can certainly be said of the lesions of tuberculosis that they are unlike in men and animals.

In pursuing this matter further we find that both susceptibility and immunity are relative, rather than absolute terms. Three varieties of susceptibility are recognized, a natural, an acquired, and an inherited, and we likewise have acquired and inherited immunity. There are two forms of acquired immunity, the active and the passive; and they are of great interest to us of the present time. Active immunity is best described by what it accomplishes. For example, the attack of an infective disease produces active immunity for a variable period. So do small doses of virulent cultures; large doses of cultures attenuated in various ways; injections of bacterial products as employed by Haffkine for prophylactics against plague; and injections of the sterilized products of the bacillus. Passive immunity is produced by antitoxins, and the individual inoculated with the antitoxin shares the immunity *passively* with the animal from whom the antitoxin is drawn. It is the condition produced by serum therapy. The antitoxin is both prophylactic and curative, but the dose required for a cure is much larger than for prevention. Inherited immunity has been shown experimentally in anthrax and tetanus. Passing on to the subject of mixed infection, he said that to render an animal immune there is another method besides that of neutralizing the toxin by antitoxin. It is by the use of *bactericides*. When micro-organisms alone are used for producing immunity, the serum develops marked antibacterial powers, while it has little

or no effect on the toxins elaborated. On the other hand when the filtered cultures (toxins) are used, the serum develops both antitoxic and bacteriolytic properties. It is apparent therefore that the sera prepared by these two methods are not identical. These principles are recognized in the manufacture of the various specific sera, such as the antidiphtheritic serum, antiplague serum, etc., and both bacteria and their toxins are, as a matter of routine, injected into the donating animal, though in antivenin (snake poison), bacteria are obviously not necessary. The animal body has the power to produce certain substances that will defend it against all sorts of alien cells and their products. While the nature of these substances is unknown, it has been shown that they are able to neutralize poisons, agglutinate cells, cause precipitation and coagulation, etc. These antibodies are classed as antitoxins, agglutinates, precipitates, coagulins, etc. The discovery of "clumping" or agglutination has been of the greatest value, and forms the basis of the Widal test in typhoid fever. Dr. Satterthwaite then referred to the following theories of immunity as the most important,—*The Exhaustion Theory, the Retention Theory, the Phagocytic Theory* of Metchnikoff, *the Humoral Theory* of Fodor, *the Cellulo-Humoral Theory* and Ehrlich's *Side-Chain Theory.* The last-named, promulgated in 1897, he said, was the most recent of the methods by which an effort is made to utilize established facts to explain the process. The fundamental idea of Ehrlich is that the protoplasmic body, or the cell (in other words) is a complex structure, consisting of a central body with lateral processes (side chains), that are capable of combining with or being replaced by other bodies. This idea is based on an analogous condition recognized in organic chemistry, which is used to explain the relations of iso-meric compounds. Ehrlich holds that the cell (protoplasmic body) is capable of forming a vast number of these processes or side chains, and that a separate process can be formed for every blood or cell poison that exists. These processes he calls *receptors.* Each receptor is capable of dealing with a single body, whatever its character or chemical composition, whether solid or fluid; but it has a double function, one of attaching itself to a protoplasmic mole-

cule and the other of inoculating the cell. The fixing agent is called the *Haptophor* (anchoring agent); the inoculating, the *Toxiphor*. If the poison is very virulent the cell is destroyed. and if many cells are damaged, the animal may die. If however, the animal survives, the damage done to the cell process (receptor) calls for a new formation of processes similar to those that have been injured. Now, the reproduction of cells to compensate for loss is a recognized pathological principle. Accordingly he assumes that a proper stimulus imparted to a cell will lead to an overproduction to compensate for the loss of substance, while a number of the receptors would be thrown off into the blood and lymph. *These cast off receptors* would then be the antitoxins. In passive immunity we have to consider some problems involving bacteria that do not to any marked extent produce soluble toxins, samples of which are the bacteria of cholera and typhoid fever. When these microorganisms are destroyed by the serum of an immunized animal it is supposed that their disintegration is due to the coöperation of two substances, an intermediary (or immune body) and a complement, because the normal serum which contains only the complement has no effect on the bacteria. The immune body resists heat, the complement is destroyed by it. but the two must be conjoined so as to produce destruction of the bacteria (bacteriolysis). Immune bodies may possibly be derived from the cells of immune animals. They vary according to the specific organism. There may be various kinds of immune bodies and complements. Disintegration of bacteria by blood sera, also, is largely dependent, it is thought, on the joint action of the complements and intermediary bodies. In discussing the subject of passive immunity, however, we are brought face to face, not only with a question difficult in itself and very largely theoretical, but complicated by the use of many new terms that are not in general use. Add to these facts that many of them are synonymous, while the same word may have different significations with different writers, it is clear that the subject has passed beyond the bound of intelligent discussion, at least so far as many of us are concerned. It is sufficient to say in conclusion that, according to Ehrlich's

theory, if immunity has been acquired, his explanation is as follows: The receptors circulating in the blood anchor any of the corresponding toxin molecules before they can reach the cells. And in passive immunity the serum of the immunized individual supplies him with these receptors, and thus confers on him protection against infection. So far as the clinical side of the attack is concerned, incubation would include both the period when the toxin molecules are grasping the receptors of the cells and also the period during which the toxiphoric agency is acting (the stage of invasion). When the antitoxin formation begins to be established the disease is beginning to yield; where it gains the upper hand, convalescence is at hand. As regards *Natural Immunity,* either the cells are developing so many receptors that there are always enough in the blood to anchor any toxins or molecules and prevent them attacking the cells, or the cells may have no receptors (processes) fit to grasp the toxin-haptophors. Besides, there must be the right kind of receptors and the right kind of haptophors, and they must be capable of adapting themselves to one another as keys and locks.

While Ehrlich's theory has naturally met with opposition, it would seem to be convenient for us to accept it provisionally as a good working hypothesis that will be helpful in discovering the principles that govern immunity, whatever they may be.

The concluding part of the paper was devoted to the subject of latency in infective disease.

Papers on *Physiological Problems,* by DR. W. H. PORTER, New York, and *Antisepsis in Surgery,* by DR. R. T. MORRIS, New York, were read by title.

INTERNAL ANTISEPSIS.

DR. J. N. HALL, Denver, Col.: The improvement in the methods of the surgeon, who a few years ago assumed the responsibility for most of the deaths from sepsis, has produced no more striking result than the almost total elimination of

this term from the list of the causes of death of his patients, while the physician still signs a comparatively large number of certificates bearing this opprobrious designation. Fortunately we are encouraged by the recent general attention given to this subject and by the favorable results which have attended, in small measure, at least, some of the work along this line. The more general use of the antitoxins might at first sight appear to render unnecessary a struggle for a system of internal antisepsis. Yet when we consider that, for instance, a definite croupous pneumonia may be caused by many different organisms, and that, until bacterial examination becomes more available than it now is in clinical examination, we shall be unable to administer the right antitoxin even if we have it, at the very beginning of the disease, as is so generally imperative if we look for good results, we must conclude that in this disease, as in many others, we shall long have opportunity for battles against a more or less general sepsis. The ability of septic organisms to do harm lies not so much in the few which first enter the blood stream as in the capacity of these for indefinite multiplication. An infinitely less powerful antiseptic suffices to prevent reproduction than is necessary to cause the death of the parent organism. It is likely that more is to be accomplished by attempts to attain the former end than the latter. It is the newly-bred plasmodia of malarial fever which are killed by quinine, rather than their progenitors. A step further and we should be able to prevent their propagation.

The most important results thus far have been accomplished in the digestive tract. It is probable that the long-practised exhibition of hydrochloric acid in typhoid fever is really soundly based upon two grounds: that it acts in part by improving nutrition through supplying a digestive ingredient lessened by the fever, thus promoting normal digestion; and in part by the prevention of growth of organisms of fermentation in the intestines. Wilcox and others have pointed out that in typhoid chlorine lessens the development of the causative bacillus and consequently the secretion of bile. It must not be forgotten, however, that often the bacilli are established in the

spleen and mesenteric glands, in the lung or even the meninges, and we must at least consider these things in our scheme of treatment. We shall scarcely cure a typhoid meningitis by the exhibition of intestinal antiseptics. A word of caution against the too strenuous use of these remedies, for we should at least beware of doing harm. Dr. Hall has recently seen a well-marked case of acute nephritis resulting from the too free use of salol in the treatment of a moderately severe attack of typhoid fever. There seems, however, to be no especial ground for fear that we shall interfere seriously with digestion by destruction of bacterial life in the intestinal canal. Although we may accomplish much by use of various bismuth compounds, naphthalin, salicylic acid, and other remedies, no generally accepted intestinal antiseptic has been brought forward.

In the urinary tract we have been more successful in the application of antiseptics to combat bacterial infection. In cystitis, pyelitis and pyelonephritis the results of treatment are now far better than under the former mode of administration of diluents and demulcents. The recognition of the typhoid bacillus in the urine has led to systematic attempts by the use of urotropin and other antiseptics, to prevent its excretion in the urine. So far as this single feature is concerned, it is certainly better to avoid dissemination of typhoid by destruction of the bacilli after their passage than to attempt their destruction in the body of the sick man. The use of such antiseptics, however, is justifiable for the avoidance of typhoid pyelitis and similar infections. A few years ago he was much interested in the study of certain infections of the urinary tract caused by the colon bacillus. Several of these cases progressed to a fatal end, and at post-mortem examination exhibited abscess formation in the most various localities. In others, to whom urotropin was administered early and in sufficient amount, the urine gradually cleared and recovery resulted. These cases offered the most brilliant examples of the influence of antiseptics given internally that have fallen under his observation.

The effect of creosote and its congeners upon the bacilli of tuberculosis, as shown by repeated examinations of the sputum during the treatment, is generally believed to be a fairly

definite one. Doubtless the results would be more easily noted were cases more generally placed under such treatment before the bacilli became abundant, and especially before mixed infection became a factor. The drugs act by rendering the soil unsuitable as a culture ground, and not directly as germicides. In the treatment of pulmonary tuberculosis nothing is more discouraging than the sepsis which follows the introduction, almost certain to occur sooner or later, of pus-producing organisms into the pulmonic lesions. Having mentioned two cases where quatities of streptococci were found in the sputum, in which the happiest effects followed the use of antistreptococcic serum, Dr. Hall expressed the opinion that whether the remedy was to receive all the credit for the improvement in these two cases or not, the results obtained should lead to a study of this method of combating sepsis with the greatest hopefulness.

He had treated many cases of pneumonia with creosotal and sodium salicylate, but had seen no such constant and positive effect as to be worthy of record. Yet we have the most positive statements of Thompson and others in favor of the treatment—a sufficient justification of further trial.

A distinct advance has been made in the introduction of colloidal silver and other silver preparations in the treatment of various septic conditions. He believed that we may await with reasonable confidence the advent of some such internal antiseptic as shall measurably compare in effect in septicemia with that of the silver salts in gonorrheal ophthalmia. The weight of evidence is certainly in favor of the continued use of Credé's ointment in those cases of cellulitis, phlebitis and other inflammations caused by pus-forming organisms. Sufficiently favorble reports have been published to lead us to use such a line of treatment at least until something better is advanced.

PROTECTIVE INOCULATION.

This paper was by Dr. G. F. Butler, Chicago. It must be admitted, he said, that the elements of error arising from the crude transference of animal results to man still exist in the

case of protective inoculations. While the microbe or protozoön found with a given disease or morbid state is regarded as the cause of that state and is cultivated to produce a serum, the anatomical and physiological differences between man and the animal are ignored, and the logical requirement of science that a given hypothesis to be accepted must not only explain all the facts, but must exclude all other explanations, is set at defiance. Brilliant as seems the line of reasoning adopted in the recent explanation of immunity by Ehrlich's side-chain theory, and valuable as some of it is as a working hypothesis, much is based on a series of hypotheses, the demolition of any one of which would impair the main theory. In the horse, diphtheria runs the same course, though of milder type, as in man, and the complications are similar, though slight; hence the reaction produced by diphtheria was found to produce an antibody, which has proved, when properly applied, particularly efficacious against diphtheria. That such an antibody could not be used by direct transference to man is shown in the tetanus produced by it in Italy and in St. Louis. This tetanus ought to have been avoided through ordinary knowledge of the horse as an intermediary host for the tetanus bacillus. Further, it would have been impossible had the ordinary tests of unit strength been applied, since the guinea pig employed therein must have been tetanized. The problem in the application of protective inoculation implies the employment of such inoculation as will destroy the toxin (the soil-element poison of the old clinicians), and at the same time create the life-giving principles constituting the antibodies at the least expense to the system. This will be best accomplished by distributing the strain generally, rather than leaving it to expend its strength on the individual cells, and this is done best by employing the specializations through which most is accomplished by the least expenditure of force. But the power of the organism to antagonize the constitutional effects of pathogenic germs, their toxins and other poisons, is directly proportionate, all other things being equal, to functional activity of the adrenal system. The problem of a protective inoculation is complicated by the factor of mixed infection, and further,

the latter is complicated by the differing effects of toxins To meet all these factors is a difficult question of great complexity, which is still further complicated by the fact, pointed out by students of comparative medicine long before Koch, that tuberculosis of cattle differs in character from that of man, this difference being much greater than that between variola and vaccinia. The problem of protective inoculation therefore implies a study of comparative medicine with the variation between man and the animal taken into account. It also involves a careful study of the hygiene and prophylaxis of the animal employed, and of the human subject before, during and after inoculation.

DISCUSSION.

DR. E. H. LONG, Buffalo, said that for the general practitioner as much can be gained by the use of intestinal antiseptics as from gastric examination and treatment based upon it. Fermentation, due to factors hindering digestion, is the great difficulty, rather than deficient digestive power. Intestinal antiseptics are of value, though the reports of clinicians do not support all the early claims made for this class of remedies. His experience had led him to believe that the agents most to be depended upon were bismuth, creosote, naphthol, and salol. As regards serum-therapy, particularly the use of anti-streptococcic and antipneumococcic sera, he thought the unfavorable opinions expressed by many were premature and not founded upon sufficient data. He mentioned two cases in which these serums were given for scarlet fever and pneumonia respectively, with the result that the patients' lives were saved.

DR. T. E. SATTERTHWAITE, New York, said that in New York the results thus far obtained from anti-streptococcic serum appeared to have been rather of a negative character, and considerable skepticism was entertained as to its practical value. At the same time, he felt that the matter had not as yet been given a sufficiently extended investigation, and he could not but think that in the future very gratifying results would be secured in suitable cases.

DR. O. T. OSBORNE, New Haven, said there was no doubt in his mind as to the value of hydrochloric acid in typhoid fever. Formerly we gave the patients a diet without salt: this was a mistake, as it gave an almost total absence of hydrochloric acid in the gastric juice. As to intestinal antiseptics, should we do away with them entirely, as the pessimists would have

us? By no means, for although they are not as efficient as we might wish, yet when given by the mouth they may prevent the invasion of bacteria into the upper bowel and stomach. Salol is on the whole the best remedy of this class, but it should not be given in large doses or for a long time unless the urine of the patient is examined daily for albumin. The moment any is found, the remedy should be discontinued. He would like to inquire the dose of urotropin recommended by Dr. Hall. Rheumatism, he believed, was an infection, but one starting from the bowel. It enters the system in this way, and the efficacy of the salicylates is no doubt due in great measure to their antiseptic power, which aids in getting rid of the toxins. Arsenic appears to be of some value in pernicious anæmia, but he had never seen any benefit from it in leukæmia. While creosote may possibly do some good in pulmonary tuberculosis, especially at first, when it increases the appetite, its long continued use in large doses is liable to produce indigestion with anorexia, from over-stimulation of the pancreas. It does not kill the bacilli, but probably exerts an influence upon the bronchi. The impairment of digestion caused by it tends to offset this beneficial effect, and Trudeau, Baldwin, Brown, and other well-known authorities do not think well of creosote.

Dr. J. N. Hall said with reference to the dose of urotropin that the patient he spoke of was a very large man, weighing 280 pounds, and that he gradually brought him up to 70 and 80 grains a day. Generally he did not exceed half a drachm in 24 hours, giving 10 or 15 grains at a dose. In typhoid fever hydrochloric acid was the most sensible of the intestinal antiseptics. In a large number of cases treated with it his mortality was only 14.7 per cent., and most of the cases were severe ones. He gave 15 to 20 drops 4 or 5 times daily. He related his experience with arsenic in pernicious anæmia, stating that every patient who was able to take as much as 15 to 20 minims of Fowler's solution was benefited, while those who could not do this did not improve. In some instances he had had good results from the use of sodium cacodylate in ½ grain doses, hypodermatically. As to arsenic in leukæmia, his experience corresponded with that of Dr. Osborne.

Dr. Satterthwaite said that in New York there had been a great deal of opposition to internal antisepsis. Many were skeptical as to the existence of any such thing. He thought it fortunate, therefore, that in this Society such a strong opinion should be expressed in its favor. So far as the germs were concerned, he did not believe it necessary to kill them. If we could render them dormant or harmless it was all that we could

expect. Niemeyer was the first to introduce the use of hydrochloric acid in typhoid fever, and he (Dr. Satterthwaite) early became convinced of its value. In former years he had obtained excellent results with it, and he was glad to have it taken up again. Theoretically antistreptococcic serum ought to be a good remedy, and he was also glad to hear favorable results reported from this. He thought it certainly deserved an extended trial. As to the remarkable efficacy of urotropin in genito-urinary troubles, there could be no question.

DR. A. J. HALL, Washington, D. C., read a paper on

THE MEDICAL TREATMENT OF APPENDICITIS.

He said it is so generally admitted that appendicitis is a surgical disease that it is more than likely the suggestion that its treatment has a therapeutic aspect will meet a prompt negative. However, so many cases recover without surgical interference that it would seem that therapeutics have not received the credit to which they are clearly entitled. In six papers advocating medical treatment, which had come to hand during the last year, he failed to discover a method or treatment that was generally applicable; no mention being made of medication with a view of directly influencing the diseased process. A diagnosis of acute appendicitis having been made, Dr. Hall's method of treatment is as follows: The patient must be placed at rest in bed, and this rest made as absolute as possible, an essential element in this regard being the installation of a nurse who can have a good influence over the patient, relieving him, if possible, of all care and certainly of all muscular effort on his own behalf. The abdominal muscles may be relaxed by flexing the thighs and supporting the knees by pillows. The vomiting and peristalsis of the bowel may be reduced to the minimum by withholding all food for the first twelve or twenty-four hours and the omission of anything in the form of cathartics or purgatives. A copious enema of soapy water or sweet oil should be used every four hours, and a hot flax-seed meal poultice must be maintained over the whole of the abdomen, replacing it every two or three hours, night and day, until the temperature is normal. This application reduces the pain to such an extent that the use of anodynes in-

ternally or hypodermatically can be avoided, especially if we convince the patient that the pain will probably subside in a day, and that medication might obscure symptoms that would be of vital interest during the next few hours. The amount of relief afforded by the poultices in the matter of nausea and vomiting, pain and fever, is the index of the success or failure of the treatment. The most important guides of the progress of the case are the temperature and pulse-rate, a steadily increasing pulse-rate being a sign of ill omen, while a diminishing rate gives assurance of a good prognosis. The only counter-indication of the use of enema, or at least one calling for great care in its use, is the involvement of the lower bowel or rectum in the inflammatory process, which occurs when the appendix is deeply seated in the pelvis; and doubt upon this point should be cleared up by a digital examination of the rectum. The rest and quiet of the bowel can be further promoted by the avoidance of repeated palpations, or even percussions, in an effort to demonstrate a swollen appendix or its surrounding abscess wall, the existence of which may be taken for granted, while the size need have no bearing on the case. When the vomiting subsides the patient may be fed liberally by the mouth with milk, water and soups. The larger the amount of liquids consumed the better, as they not only nourish the patient, but by means of the diuresis produced render material aid in the elimination of toxic materials. Creosote, minim one, in two drams of lime water, may be administered every two or three hours, and arsenite of copper, grain 1-100 every three hours. The creosote is eliminated, in part at least, by the kidneys, and must therefore, while in solution in the blood, be brought into most intimate contact with the inflamed area, and does, he believes, exert a salutory effect upon the inflammatory process and the toxic elements generated thereby. The arsenite of copper he employs as an intestinal antiseptic, and he is convinced that it prevents or diminishes tympanites and the tendency to vomit, and has a marked anodyne effect. If the vomiting does not subside, or should it become stercoraceous, occlusion or paralysis of the bowel is indicated, and operation is the only hope of relief.

Between the twelfth hour and the end of the second day symptoms will usually begin to mitigate, the pain, temperature, and pulse-rate all gradually subsiding. The patient then passes on to uninterrupted convalescence, the case terminating in complete recovery in from seven days to three weeks. On the other hand, if the pain should suddenly disappear, the temperature drop to normal or below, the tumor diminish in size, the abdomen become tympanitic, the pulse-rate remain high or increase in frequency, and symptoms of shock develop, it may be expected to recur with increased severity in a few hours, and another stage, acute diffuse septic peritonitis, is reached, where operation is indicated, though under very unfavorable circumstances. The condition is so hopeless in fact that some surgeons have refused to operate, partly because it may be attended by one or two secondary abscesses; yet even this condition has been successfully tided over by reinaugurating the treatment at first outlined, and at the same time using stimulants liberally and large amounts of normal salt solution hypodermatically.

To recapitulate: An efficient medical treatment of acute appendicitis is as follows: Rest in bed, hot poultices to the abdomen, a liquid diet, chiefly composed of milk, four to six enemas a day, internally the arsenite of copper and creosote. Purgatives and opiates are not to be used.

Conclusions.—The tendency of appendicitis is toward recovery. All acute cases should be treated medicinally until, after mature deliberation, it is shown that operation offers a better prospect for recovery. In recurrent cases operation should be advised during the interval after recovery from the second attack.

DISCUSSION.

Dr. O. T. Osborne, New Haven, said he could but take exception to many points expressed in the paper. Appendicitis must always be considered a surgical condition, and even in a first attack the question of operation must be constantly before the mind of the physician. It should be remembered that the extent of the abdominal lesion is often out of all proportion to the severity of the symptoms. The important thing is to prevent perforation, and not to wait until this has oc-

curred before operating. If ice-bags do not relieve the pain and other symptoms in a few hours, and especially if leucocytosis be present, an operation must be done. A certain bad state of the pulse indicates the necessity for this, and in a few hours the condition may be so serious that operation will not save the case. The fact that a patient occasionally recovers under medical treatment should not lead us to minimize the value or necessity of surgical interference. As to bowel antiseptics, he did not think the agents mentioned, copper arsenite and creosote, would do any good. It is better to depend on the stoppage of food or on a liquid diet (perhaps not including milk). The physician and the surgeon should work together in these cases. The absence of leucocytosis does not necessarily signify that an operation is unadvisable. A few hours may mean life or death to the patient. He mentioned a fulminating case in which the patient, a Yale student, died from perforation within two days of the onset of the attack. If an answer had not been waited for from the young man's parents, he might undoubtedly have been saved by an early operation. He would be very sorry to have the views expressed in the paper go forth as the sentiments of this Society.

DR. L. WEBER, New York, said that since 1867 he had seen all possible varieties of appendicitis. His early papers on perityphlitic abscess with perforation were the first upon the subject published in this country. He was the second in the United States to operate for appendicitis with acute abscess, the late Dr. H. B. Sands being the first. At the present day the general consensus of opinion is that, having severe symptoms, immediate operation is advisable. The light cases are more common than severe ones. In twenty-fours hours the patient may generally be relieved. Yet the exact state of affairs in the abdomen cannot always be ascertained from the symptoms. There may be no apparent sign of a threatening perforation, and still perforation may be imminent. The question of operation must always be decided according to the merits of each individual case. No definite rule can be laid down which will cover all cases. Whether to operate or not must depend upon the pulse, the temperature, and the general condition. When the symptoms are not urgent, one need not operate; evacuate the bowels, and the symptoms will disappear in dozens of cases, even with a temperature of 103. In many of these cases there are no relapses, but in many more there are. In one instance the patient had eleven relapses before he would consent to an operation. As to the medical treatment, objection is often made to the use of mor-

phine. He could not see, however, why it should not be employed in small doses, after the bowels had been moved, and it was his practice to give one-sixth to one-quarter grain hypodermatically. He could not say that cases had been cured by medical treatment, but at all events they had got well. Appendicitis cases must always be watched with the greatest care. There is always danger of accident, and, in those not operated on, of relapse. Some of the severe cases begin with perforation, and here the more promptly the operation is done the better the chance of saving the patient's life. The absence of symptoms sometimes met with was well shown in the following case: The patient was a young German woman, who had never before been ill. At 10 o'clock on a Saturday evening she felt sick at the stomach. She went to bed, and Dr. Weber saw her on Sunday and again on Monday. All the symptoms were negative, except that her pulse was 140. He operated at St. Mark's Hospital, and found appendicitis with perforation. And yet there had been no significant symptoms whatever.

DR. D. O. LEECH, Washington, did not believe that any case of appendicitis was ever cured by medical treatment. It is a surgical disease. Some cases recover spontaneously, but afterwards the patient is always liable to a recurrence of the trouble. A person who has once had appendicitis is like a man going around with a stick of dynamite in his pocket; one can never tell when it will explode. Each attack predisposes to another. In rare cases, however, there is no recurrence. The physician who trifles with the disease, and treats it only medically, will sooner or later make a grave mistake.

DR. W. M. SPRIGG, Washington, said that the general practitioner should always be on the lookout for inflammation of the appendix. Appendicitis is essentially a surgical disease. Failure to recognize it is sometimes due to the fact that it does not always begin in the appendix; the lesion does not become localized until later. No matter how mild or how simple a case appeared at the beginning, he made it a rule, if there is increasing heart weakness, even though the temperature is declining, to call in a surgeon with a view to operating.

DR. C. BECK, New York, said he felt grateful to the internalists for defending the surgical position. He could not see how any medical treatment could affect an inflamed appendix, any more than it could a boil or a felon. If pus is present, it must be evacuated. The main difficulty in this disease is that we have no means, short of a laparotomy, of finding out the actual condition of the parts. All the symptoms and appear-

ances may point to a mild lesion, when in reality the appendix is on the point of perforation, in any given case. There is often a great discrepancy between the clinical phenomena and the anatomical condition. All the symptoms and appearances may point to a mild lesion, when in reality the appendix is on the verge of perforation. Hence he never called any case of appendix a mild one. While the symptoms may be mild, they are likely to afford no index of the anatomical condition. This feeling of uncertainty leads the surgeon to operate oftener than he otherwise would, in order to give the patient the best possible chance. No doubt a large number of cases will get well under any treatment, but which are the cases that are going to do this? We don't know. There is always great uncertainty as to how the patient is going to be to-morrow. It is often the best plan to operate, and thus find out just what the condition is. The cases of early operation get well, while the later ones often prove fatal. He had not for a long time, he said, lost a single patient who was operated upon early, but not infrequently the cases in which he was called in to operate on the fifth day or even later, proved fatal. In view of the uncertainty as to the character and extent of the anatomical lesion, he thought we should choose the lesser of two evils, and operate early.

DR. HALL, in closing the discussion, reiterated his conviction that the fact that so many patients recover under medical treatment indicates that there must be some efficacy in the remedies employed.

A paper on

THE NEED OF REVISING OUR IDEAS OF STIMULATION.

was read by DR. E. H. LONG, Buffalo. The usual definition of stimulant, "An agent that increases the activity of an organic function or process," he said, conveys the central idea, but falls short of a full grasp of the present usage of the term. He offered, as a basis for discussion, this proposition: That, in view of the more exact knowledge of the influence of drugs upon the system which obtains to-day, we cannot employ the term stimulation as meaning always a definite and invariably kind of influence or phenomenon. The action and the effect of a drug cannot be the same. The action may be obscure; the effect must be apparent. The action of a drug consists of a modifica-

tion of conditions, chemic, thermic, electric, or structural, which determines an alteration of function. The result of this alteration, when apparent, is known as the effect of the drug. The pharmacologist and the clinician have entirely different ways of estimating stimulation, the former studying the action of the drug, the latter the results of its action. What is stimulation in the view of one may be the opposite in the view of the other. Thus, glonoin has a reputation as a circulatory stimulant from clinical observation of the effects of its action, but the action itself, from the physiologic point of view, is essentially depressant. Aconite, on the other hand, is regarded clinically as a circulatory depressant, but the slower pulse rate and weaker heart action are largely the results of what the physiologist must call a central stimulation.

The restraining factor, which we have come to believe is associated with all important functions, must often modify our estimate of the influence of a remedy. Inhibitory activity will prevent the full realization of the potential of a stimulant drug, while the removal of inhibition may be the equivalent of stimulation. It may be thought that our final definition of stimulation must come from the physiologist; but we reflect that he is not working within the proper field of stimulation. He is using tissues in as nearly normal condition as possible, while practical stimulation presupposes an abnormal condition. In order to develop this thought we must appreciate the limitations of stimulation. We recognize that an organ has a certain range of action that may be called physiologic, within which it reacts to the work demanded of it. Functional activity, therefore, is a variable quantity, influenced on the one hand by the strength and nutritive resources of an organ, which are opposed, on the other hand, by the amount of work imposed upon it. The physiologic minimum of activity must also vary as modified by these influences. Now, as long as an organ is working efficiently within its physiologic range it needs no stimulation; but when, from disability or from excessive demands made upon it, its activity falls below the physiologic minimum, stimulation is indicated. It is observed, moreover, that normally acting organs do not show as much

response to stimulants as those whose action is deficient. The physiologist is studying biologic reactions. In analyzing the action of stimulants he is dealing chiefly with two factors—increase of irritability of cells and more ready discharge of their energy. These factors are dsitinct. They should assume a greater importance in aiding our classification, as we shall see later, but they do not explain the whole of stimulation as the clinician sees it. His view of the subject is more inclusive, although his object is a very simple one. He wants greater efficiency in a function, however it may be obtained. In one case it will be secured by temporary rest; in another by restraint; in another by positive stimulation of an organ. Thus many agents of quite diverse physiologic action will be included in the clinician's list of stimulants.

In view of this divergence it seems unlikely that we can agree upon a definition that will be strictly scientific and sufficiently inclusive; but it will answer our present purpose if we discuss a basis of classification, and upon this offer a suggestion of what our definition ought to include. In the regular exercise of most functions in the living body, four factors are present: (1) reserve energy; (2) irritability; (3) activity or discharge of energy; (4) restraint or inhibition. Supplying reserve energy pertains rather to the use of tonics, but the relation is so close as to merit brief remark. There may be a diminution of reserve energy by reason of hemorrhage, damage to blood and tissues by poisons, or from various other causes. Here whatever contributes to a restoration of the nutritive qualities of the blood and the volume of fluid in circulation, will serve our purpose. But, assuming that reserve energy is sufficient, an increase of the efficiency of a function may be secured by modifying any one of the three other factors, i.e., by increasing irritability of cells, by causing more rapid or more powerful discharge of their energy, or by removing restraint. Here is our basis of classification of stimulants. It will be developed and illustrated by reference to the action of several well-known drugs.

First, as pertaining to the factor of irritability of cells, strychnine is our example. It might be proper to include un-

der this heading, with irritability, also conductivity by nerve cell or nerve fiber. Strychnine acts chiefly by influencing irritability and conductivity in the nervous system, or in other words, by improving innervation. It does not cause a discharge of energy, but permits a readier response to normal stimuli. It may therefore be called a potential stimulant. Even in poisoning by strychnine the convulsions do not originate independently of external stimuli, as is shown by the fact that they do not occur in a strychninized frog when the surface of the body has been previously cocainized. Herein lies the superiority of strychnine as a general stimulant—that it does not cause an exhausting discharge of energy, but simply places the nervous system, and possibly the muscles, in a condition more responsive to the needs of functional activity. This appears to the writer to be a very important distinction in favor of the general usefulness and value of this drug in such diseases as pneumonia, typhoid fever and diphtheria, when stimulation is desired without exhausting either reserve energy or irritability.

The second kind of stimulation, that which increases activity by causing either more frequent or more violent discharges of energy, may originate in several ways. For example, we find that the heart will respond to any considerable irritation of sensory nerves, however it may be produced. Pain will induce a rise of arterial pressure. Faradism will give the same result. Stimulation of this nature is brought about in an indirect or reflex manner. So-called diffusible stimulants, such as ammonia and alcohol, probably induce much of their effect through such local irritation, being diffusible in effect rather than in action. Caffeine and drugs of the digitalis group act more directly upon the heart, but they belong to this general class, caffeine causing a more rapid heart action and digitalis more forcible contraction. This whole class may be called kinetic stimulants, for the reason that they cause a more rapid change of reserve energy into kinetic energy. It is plain that, by causing an increased discharge of energy, these agents tend to induce exhaustion, and this is the fact to be emphasized in comparing them with the class of potential stimulants.

They have in their excessive action the possibility of defeating the very end to be gained by stimulation, hence their continuous use must be carefully supervised.

The place of the third factor under consideration, that of inhibition, admits very readily of demonstration. The fact that we can arrest the heart's action by galvanizing the vagi, or increase the pulse rate decidedly by depressing their centers by glonoin, without any direct action upon the heart itself, establishes the importance of the inhibitory influence. No one will deny the stimulant effect of glonoin upon the circulation. Clinical experience has given it a place in which it easily outranks any other drug, and that place is where the peripheral circulation is insufficient and the heart is embarrassed in consequence. But it may be soundly argued that its action, physiologically considered, is a depressant one, in moderate dose depressing vagus centers and vasoconstrictors, in large dose depressing the heart and respiratory center. Notwithstanding this, it will hold its place as a practical circulatory stimulant in proper cases, and it rests with the therapeutist to reconcile differences by more liberal definition of the term stimulant.

It would seem that a remedy that is capable of removing inhibitory restraint, and thereby allows an increase of activity of an organ, should be regarded as a stimulant so long as the results of its action is salutary. If we adopt the basis of classification here presented, we recognize three general classes of stimulants:

1. Agents that increase the irritability of nerve centers or the conductivity of nerve fibers, thus increasing the potential of a fuction.

2. Agents that determine a more rapid or more powerful discharge of energy in the activity of a function, thus converting potential into kinetic energy.

3. Agents that depress the nerves or nerve centers which exercise a restraining or inhibitory influence over an organ, thus allowing greater freedom of activity in its function.

It may not be easy to classify all stimulants under these headings, but whenever the physiologic action of a remedy is determined, this, together with clinical observation of its

effects, will soon give it its place. Coming to a precise definition which shall be sufficiently inclusive, the following is suggested for consideration: A stimulant is any agent that increases temporarily the efficiency of a function, by improving the innervation, or increasing the activity, of an organ, or by lessening the restraint to its action.

DR. JESSE SHOUP, Washington, D. C., read a paper on the

TREATMENT OF CHRONIC COLITIS.

It was his purpose, he said, to make no division of chronic colitis, but to treat under the one general head, chronic colitis, mucous colitis, membranous colitis, follicular colitis, and ulcerative colitis, believing they are simply different stages of the same disease. The symptoms of chronic colitis are those of chronic intestinal indigestion, furred tongue, a sensation of heaviness, mental depression, melancholia, insomnia, sallow complexion, exhaustion, and chronic constipation, with the passage of hard fecal masses covered with mucus. There are periods of exacerbation, when larger amounts of mucus are expelled, and greater soreness and pain are present, but mucus is never free from the stools for any length of time. Since most cases of chronic colitis occur in women, there must be some special cause peculiar to the sex. In seeking for this cause we find a large percent. of women who suffer from gastroptosis, enteroptosis, and nephroptosis, and he never saw a case of chronic colitis in which gastroptosis or enteroptosis was not present in some degree. The effect of these displaced organs induces that tired, dragging feeling of which these patients complain, and in time is sure to leave them extremely nervous. It is no wonder that all of these patients are neurasthenic. Impaired digestion is but the natural sequence with all that follows. Every patient with chronic colitis will give a history of long-standing indigestion in some form, which, to the medical mind, means some pathologic condition in the organs of digestion. In his opinion, improperly prepared chyme entering the intestines, causing first irritation,

later inflammation in almost all cases, is the cause of chronic colitis, and therefore in treating chronic colitis the first thing to do is to remove the cause of the indigestion.

Believing this cause to be chiefly found in these displaced organs, it is his custom always to replace these organs and hold them in place by a properly fitted corset made to measure. The next step in the treatment of this disease is the taking of a test breakfast or test-meal to ascertain the digestive power and condition of the stomach, and by chemical analysis of stomach contents, to determine the kind of food that will be most suitable to the individual. A properly selected diet is of the utmost importance, and no fixed general rules to suit all cases may be laid down. When there is a deficit or absence of hydrochloric acid in the stomach, meats should be partially or wholly excluded in the beginning of treatment, especially when the motor power of the stomach is lessened. In cases with extreme constipation and passage of mucus, the diet of von Noorden, leaving a large residue, and consisting of graham bread, whole wheat bread, corn bread, spinach, kale, cabbage, lettuce, asparagus, cresses, fruits with skins and seeds, etc., has given the best results. In cases with symptoms of diarrhea, a diet consisting of milk, broths, clear soups, gelatin, custards, eggs, and peptone, leaving a small residue, is more suitable. When a patient is nervous and thin, a rest of one or two hours after the main meal should be insisted upon. In those cases in which the patients are thin, it is of the utmost importance for them to gain weight. To this end oils and fats are indicated, especially when constipation exists, and butter and olive oil, with plenty of cream, seem to be most generally accepted. Plenty of fresh air is essential. Change to a pure mountain air or to that of the seashore, where the patient is free from anxiety, often promotes a cure when all other treatment fails.

The medical treatment consists of remedies to overcome the constipation, assist digestion, and allay fermentation. When the olive oil and diet fail to meet the first indication, castor-oil is one of the best, if not the very best, remedy. It is most important to keep the bowels open daily. Vaselin is

a good laxative and lubricant for such purposes. Salines are not so generally useful. The digestive ferments, pancreatin, papain, and diastase, are the best digestives and are very helpful. Hydrochloric acid and the bitter tonics, such as condurango, gentian, nux vomica, and strychnine, with intestinal antiseptics, such as salol, salicylic acid, resorcin, menthol, thymol, creosote, all play an important part in the treatment. Massage of the colon, as practised by von Noorden, is useful. Local treatment of the bowel by high enemas of alkaline solutions followed by astringent solution of krameria, pinus canadensis, and silver nitrate, give great relief, and are recommended. Large enemas of olive oil should be given while the patient is in a recumbent position, and allowed to flow by gravitation high up in the colon. They are soothing, healing, and lessen constipation. These enemas should be given at night, and retained as long as possible. The quantity should range from three ounces to as much as a pint, according to the ability of the patient to retain it. When hemorrhoids are present they should be removed or treated locally. When the lower bowel is greatly inflammed, topical applications through the proctoscope with spray are beneficial. For the treatment of pain in chronic colitis, such as precedes the passage of mucus, and when enteralgia and enterospasm are present, a hypodermic of morphine and high enemas of oils or of some saline solution, and a large dose of castor-oil by the mouth to cleanse thoroughly the intestinal canal, give the best result. The treatment of this very chronic and troublesome disease is in many cases unsatisfactory at the best, relapses are frequent, and it is only by patience, care, and persistence that any progress is made.

Recapitulation.—1. Treat the attack of pain which precedes the passage of mucus by a hypodermic of morphine and atropine, and promote thorough evacuation of the bowels by large doses of castor-oil by the mouth, and high enemas of oils or of alkaline solutions.

2. A carefully selected diet to suit the individual case, after a chemic examination of the stomach contents has been made.

3. Assist digestion and allay fermentation.

4. Keep the bowels open by means of oils by the mouth, which have the double office of laxative and lubricant.

5. Apply suitable support to overcome any ptosis of the abdominal organs.

6. Local treatment by means of astringent enemas and oils, and topical application of the same when necessary.

7. See that the patient gets sufficient rest in the recumbent position, and, when practicable, a change to the air of the mountains or seashore.

DR. O. T. OSBORNE, New Haven, read a paper on

THE ETIOLOGY AND TREATMENT OF ARTERIOSCLEROSIS

It is agreed, he said, that several causes produce the condition of arteriosclerosis, and he wished to suggest a theory as to why these varied causes produce the one condition. Now, what is it that makes a man have ever gradually increasing hardening of his arteries as age comes on, and then what makes him have it at a younger age? What is it that raises the blood-pressure and increases the arterial tension just as normally after sixty years of age as the bone growth of childhood is normal, the menstruation and virility at puberty, and the menopause at forty-five years? To account for the bone growth of childhood we find the thymus gland working hard up to twelve years of age. To account for puberty we find the ovaries and testicles beginning to functionate and the thyroid increasing its activity. To account for the menopause we find the ovaries atrophying. Now, what accounts for the increased tension of the blood vessels? Why should we not look for the cause among the organs furnishing internal secretions, viz., the ductless glands? Our investigation should be of the glands furnishing secretions that modify the blood-pressure, and if possible to then discover which of these glands change their functions after sixty years of life.

The glands which furnish secretions that modify the blood-pressure are six in number, one of which, the thymus, furnishes vasodilator stuff up to the time of the cessation of its function, viz., before puberty. Of the other five glands, two furnish vasoconstricting stuff, the suprarenals and the pituitary, and three furnish vasodilator stuff, viz., the thyroid,

the testicles and the ovaries. As far as we have yet discovered, the suprarenal glands furnish par excellence the vasoconstrictor stuff for the organism. Man and animals cannot live after extirpation of the suprarenal glands, neither can they live when these glands suffer from tuberculosis, i.e., from Addison's disease, and it will be remembered that one of the constant symptoms of Addison's disease is progressively increasing low blood-pressure. We now recognize supersecretion of the thyroid and undersecretion of the thyroid, and why can we not conceive that the suprarenal glands can also furnish too much or too little secretion, and therefore more or less vasocontracting stuff? Probably, many of the cardiac failures in acute infections are due to the action of the toxines on these glands, and not on the heart or vasomotor centers, as so often declared. Also, doubtless, many of the causes of shock after laparotomy are due to the disturbed function of the suprarenals, possibly through the injury or manipulations of the sympathetic abdominal nerves. While we recognize the group of symptoms which we term Addison's disease, which means more or less total absence of suprarenal function, we have not taken into consideration the fact that every secretion not only can be decreased or increased homogeneously in all its elements, but can also have certain elements only of its secretion decreased or increased. Dr. Osborne believes that the trouble in neurasthenia is that the vasoconstrictor stuff of the suprarenal glands is not properly secreted, although the other elements of this glandular secretion may be normal in amount. The pituitary gland also furnishes a small amount of vasoconstricting stuff. The pituitary, situated in the brain, must seemingly furnish some secretion that is necessary to the brain functions, but just what prominence the vasoconstrictor secretion from this small gland has in the blood, which is so well supplied by the two large suprarenal glands, it is impossible to state. We do not even know why the bones grow when the secretion of this gland is increased.

Turning now to the opponents of this vasoconstricting stuff, we find that the thyroid is the gland that furnishes the greatest opposition. Probably one of the functions of the

thyroid is to dilate the blood-vessels. It is a clinical fact that the blood-pressure can be lowered by administering thyroid, even in small doses, and a case has been reported where sudden death from heart failure was due to an over-administration of thyroid. In Graves' thyroid disease, or exophthalmic goitre, low arterial tension is a more or less constant symptom, and after fifty, when the thyroid begins gradually to diminish its secretion, the blood-pressure gradually rises, until in old age, when the thyroid has atrophied, the blood tension is at its highest and arteriosclerosis is in evidence. The ovaries have also been shown to furnish, at least during their period of congestion, vasodilator stuff. The analogues of the ovaries, the testicles, as far as known, have not been proved to furnish a vasodilator stuff, but as they contain considerable nuclein, we are no doubt justified in believing that their secretion can cause vasodilatation, as does nucleic acid. How frequently this sort of secretion enters the blood stream, and what small part it plays in regulating the general vasomotor tension, is not known.

After thus briefly studying the glands that furnish secretions that modify blood tension, we must come to the conclusion that it is the thyroid that furnishes vasodilator stuff and the suprarenals that furnish vasocontractor stuff, and any marked increase of tension must be due, in the absence of drug stimulation, to a diminution of the thyroid secretion or an increase of the suprarenal secretion, or to both. The other hypothesis, it seemed to the writer, must be the possibility of some irritant in the blood, either stimulating the vasomotor centers to keep up peripheral contraction, or that some irritant in the blood finally causes a slow-going endarteritis, with the resulting arteriosclerosis.

The accepted causes of arteriosclerosis are old age, nervous strain, overeating, the abuse of alcohol, severe muscular exercise, syphilis, chronic lead poisoning, kidney insufficiency, and gout. There may be too much suprarenal secretion at any age, or too little thyroid secretion at any age, but old age, with its normal high arterial tension, is probably due to an absence of thyroid secretion and the consequent at least rela-

tive increase of suprarenal secretion. A man with this increased pulse-tension often has, perhaps, for years, good compensating hypertrophy of the heart to overcome this increased peripheral resistance, and Albutt thinks there is also a hypertrophy of the muscular coats of the arteries. Hence, as long as there is this increased power of propulsion of the blood, the man has no trouble, but if anything upsets this muscular power he begins to have a sense of fatigue, low spirits, and some sort of general discomfort for which he may see a physician. If we recognize the cause of the trouble at this time and the coming arteriosclerosis and give him proper advice, the disease itself may be postponed for years. He should eat less, drink less, take regulated exercise to get more blood into his muscles and relieve the arteries, take regularly, once in so often, a period of business rest, and perhaps some proper medication. However, these very cases, so used to hypertension as they are, cannot stand large doses of drugs that cause arterial depression without complaining of malaise. This same high tension causes increased kidney activity, and this, plus the toxines absorbed from overeating and drinking, with consequent imperfect digestion, little by little can irritate the kidneys until chronic interstitial nephritis is the outcome. Also, a heart can become incompetent on exertion after years of this permanent high tension, even if arteriosclerosis as such is not discoverable.

Nervous strain is a cause of arteriosclerosis that is becoming more and more prominent. Few of us realize the constant tension under which our daily life is lived. Blood-pressure measurements are shown to be largely increased by the slightest nervous disturbance, mental anxiety, or intense interest. Men of brains who crave alcohol in some form do not want it so much for the momentary stimulant effect as for the vasodilatation which it causes, relieving this hypertension which is making them more nervous.

Overeating may be due to the absorption into the blood of too many toxines from imperfectly digested food, thus irritating the blood vessels to contract and finally causing an endarteritis; or can we not suppose that some of these absorbed

toxines may irritate the suprarenals to increased action? Increased suprarenal activity is certainly not the only cause of arteriosclerosis, and hyperextension is a large predisposing factor. The causability of alcohol may be hard to trace. Certain it is that it stimulates the thyroid gland, which gives an increased amount of vasodilator stuff, and the repeated stimulation may sooner or later cause an atrophy of this gland, and hence a diminution of vasodilator secretion. Also, where alcohol has been found to be the only apparent cause of arteriosclerosis, there is also some liver or kidney disturbance, either one of which will tend to raise the blood-pressure. Severe muscular exercise as a cause of arteriosclerosis is not as prominent as it once was when more severe physical labor was needed. Now machinery has displaced a large part of this cause of the disease. But where there is a demand for severe muscular work it is quite probable that there is also a demand made on the suprarenals for extra secretion, and this secretion has been proved a strong muscle stimulant. Also during increased muscular exercise there is increased tension of the peripheral arteries from contraction of the muscles. This slows the blood stream and raises the blood-pressure in the rest of the arteries in the body, and this increased pressure, constantly repeated, may alone be the cause of arteriosclerosis.

Syphilis as a precedent of this disease cannot be declared a cause until we have separated its results from the results of the chronic action of mercury. Dr. Osborne believes that most metals interfere with the action of the thyroid gland and that the prolonged action of mercury causes atrophy of this gland, and increased blood-tension and connective tissue formations are the result. In fact, it is his opinion that all drugs which we have classed as alternatives act as such by modifying the secretions of one or more of the ductless glands. In chronic lead-poisoning, again, we have a metal that no doubt interferes with the action of the thyroid, and again we have the suprarenal in full sway, high blood pressure, slow pulse, and connective tissue deposits. In kidney insufficiency arteriosclerosis may be due to the leaving of irritants in the blood which cause a slow-going inflammation of the arteries, endarteritis,

or if a considerable amount of liquid is drunk, or but a small amount of liquid, even water, is drunk, and a not proportionate amount of urine excreted, the blood vessels are overfilled, and the blood-tension from this cause alone becomes high. Hence, when there is kidney insufficiency, the approved method of giving large amounts of plain water or medicinal water daily, or even large amounts of milk, he believes often not to be good treatment. Of course, it is many times hard to state whether the disease of the kidney precedes the high blood-tension in arteriosclerosis or whether an arteriosclerosis preceded the kidney trouble. A gouty diathesis is perhaps one of the most frequent causes of increased blood-tension. An increase of uric acid in the blood has been proved to be often present in gouty conditions, but it has not been proved to be the cause of the disease. He is inclined to think that disturbed suprarenal secretion, perhaps an increase of it, which means not only the part of its secretion that increases vasomotor tension, but also all its other ingredients, may be a cause of gout. He has many times held gout in abeyance and prevented its exacerbations by judicious thyroid medication, i.e., the antithesis in many ways of suprarenal secretion.

Whichever may be the primary cause of arteriosclerosis, whether these above factors just related, or whether the plus tension, certain it is that any treatment of the condition, to be successful, must aim to diminish the high blood-pressure. This can be accomplished well by thyroid extract in small doses if we believe there is evidence of diminished thyroid secretion. It must be remembered that any small dosage of iodide or iodides will stimulate the thyroid gland to greater activity, and hence the long known value of this drug in arteriosclerosis. If possible, all severe muscular activity and all nervous strain, or anything that tends to increase peripheral tension, should be prevented. Large quantities of liquids, even water, are not often good treatment, as they tend to overfill the blood-vessels. A modified, diminished, mixed diet, alcohol—free if possible, without contractor stimulants as caffeine, coffee and tea, spices, or any drug such as strychnine or digitalis, unless there is actual cardiac failure—will give the best results. The great

value of rest, especially mental, must not be forgotten, whether this be a rest for so many hours each day, or a rest of two or three days weekly, or a rest of a month or two annually. The moderate use of tobacco after thirty years of age may be of benefit to these hypertension cases rather than otherwise. In excessive amount it will precipitate a cardiac insufficiency. In cases of arteriosclerosis without kidney or liver lesion, in a patient sixty years of age or more, it is quite possible that small doses of alcohol, especially at night, may cause sufficient vasodilatation to give him some bettering of symptoms that may be present, but this same improvement can generally be caused by nitroglycerin in small doses, even as little as 1-400 of a grain three or four times a day. Nothing has yet been discovered, except opium, that will diminish suprarenal secretion if this is in excess. It is possible that in the future one of the suprarenal glands might be removed or its artery tied in gout and arteriosclerosis. This will not seem so strange a statement if it is remembered that the thyroid is now partially extirpated or its artery tied for its hypersection or Graves' disease, with increasingly successful results.

DISCUSSION.

DR. J. N. HALL, Denver, said it was sometimes striking to note the effect of severe work and physical strain as an etiological factor. An instance of this was the case of a mining engineer, 41 years of age, and previously in good health, who was obliged to tramp 700 miles on foot, with a pack on his back, over the mountains of Alaska at a forced rate, his average distance being 35 miles a day. Some of the passes he encountered were 6,000 feet high. Here the long-continued strain, owing to the extreme muscular exertion, was by far the most prominent element in the development of arteriosclerosis. Now, in the prime of life, this man's day is done. When the kidneys do not work well, the flushing of these organs with a large amount of fluid is of great service, and of late he had also observed marked benefit from the use of aconite, of the value of which he had always before been skeptical.

DR. L. WEBER, New York, thought we must distinguish between the dangerous and the mild forms of arteriosclerosis. Nervous strain alone may, indeed, be the cause of the condition, but it is not as common a cause as is generally supposed.

He had made many autopsies in these cases, and he had come to the conclusion that when this disease (and particularly arteriosclerosis of the cardiac vessels) attacks men under fifty, we will almost invariably discover evidences either of syphilis, alcoholism or gout; though lead-poisoning may also be a possible cause. As to syphilis, he would go so far as to say that any person who has had syphilis (whether the disease was properly treated or not), is more liable to have arterio-sclerosis than one who has not. In syphilitic arteriosclerosis he believed in small doses of the iodides, not as a rule more than 15 grains a day. He had seen a considerable number of cases of gouty arteriosclerosis, the condition being due to the degeneration resulting from the disease. These were also benefited by small doses of the iodides. Large doses he thought too depressing. But mercurials and iodides are directly antagonistic to intra-vascular growths which are different from the normal.

DR. OSBORNE said it was an undoubted fact that between the ages of 50 and 60 something in the system causes a deposit of connective tissue. What relation this has to the production of arteriosclerosis has yet to be determined.

DR. L. KOLIPINSKI, Washington, read a paper on

ARTHRITIS DEFORMANS AND ITS TREATMENT.

The arthritis deformans of Virchow (1869), which, he said, was first correctly recognized as a particular disease by Beauvais in 1800, is a chronic degeneration of the joint cavities, and has a special and distinct symptomatology which for centuries was confounded with gout, with rheumatism, and other infectious diseases of the articular apparatus. Its etiology is as yet undiscovered. Its pathology consists in mucoid degeneration and disappearance of the central part of the cartilage; erosion and eburnation of the exposed bone; hypertrophy and fatty degeneration of the synovial membrane; new peripheral cartilage growth, and later ossification thereof. A. E. Garrod says there is a fluid effusion, others, that the parts are dry. With these profound changes, fibrous adhesions do not occur, and bony ankylosis only in the disease of the vertebral column. There is secondary atrophy of the voluntary muscles and anemia. The disease may seize upon the joints

of the upper and lower extremities, with or without involvement of the vertebral column and of the temporo-maxillary articulation. Its invasion is centripetal and symmetrical (this is the polyarticular or multiple form). At all ages except infancy, it is five times more common in females than in males. Most cases develop between forty and fifty years. It is the most frequent acute or chronic disease of the joint system, and is so common in middle-aged and elderly women that the theory of its being a senile change is at least plausible.

The disease has acute exacerbations simulating mild articular rheumatism with slight febrile temperature. There is constant complaint of pain, articular, muscular and neuralgic; of stiffness of motility, tenderness of the joints. The swollen joints stand out more prominently, because of the wasted muscles. This fixation of the joints may, by natural progression, be temporary or permanent, limited to the knees or vertebral column, or so general that the helpless victim, with mummy-like rigidity, cannot even use the jaw in mastication. There is not spontaneous recovery, and the afflicted live for years. The termination of the disease in its natural course is rude and truly deforming. The monarticular or senile form affects the vertebral column most disastrously as spondylitis deformans, more common in men; malum coxæ senile, in both sexes. Occasionally it also affects a shoulder, elbow or knee. That these varieties all belong to the same affection as the polyarticular is proved by the fact that all have symptoms present in common, which must always be considered for correct diagnosis, to wit: (1) Heberden's nodes of the phalangeal joints of the fingers; (2) numbness and tingling of the hands and forearms; (3) crepitation of the knee-joints, especially of the left side. This is produced by pressure on the patella with rapid flexion and extension of the leg; (4) a pulse of 100 or more beats per minute. Heberden's nodes and knee crepitus are found in every case of arthritis deformans.

The indications for treatment of this extraordinary malady in our present imperfect knowledge of the same is comprised in the following summary: (1) Relief from pain; (2) correct the stiffness and rigidity of the affected joints and muscular

contractures; (3) increase the muscular strength; (4) cure the anemia; (5) increase, where necessary, the body weight; (6) symptomatically regulate or slow the pulse. To fulfil these indications three agencies are necessary, and so indispensable is each one that no two alone will suffice to achieve good results. They are (1) for pain, anemia, the rapid pulse and malnutrition—arsenic; (2) for stiffness, contracture and muscular atrophy: voluntary exercise; and (3) for weakness, anemia, loss of weight and the pain, greater nutrition brought about by increasing and selecting the food supply.

Success with arsenic depends on the method, manner and length of time. It should be used a year or more. It must be so administered that mild arsenical poisoning does not occur. For the mild type, one or two drops of the liquor potassii arsenitis U. S. P. after meals thrice a day may be used for a very long time, with very satisfactory results. The pains, whether muscular, articular or neuralgic, disappear after a month or two. When this has been achieved, the treatment must continue with unremitting regularity. Arsenite of zinc may be used instead of Fowler's solution. The dose is one-twelfth of a grain in the form of a pill, repeated twice a day. In the severe forms the arsenic is used in hypodermatic injection, as by the mouth the effects are too slow and uncertain. The risk in loss of time is too great a venture. An injection should be made in the lateral gluteal region every third or fifth day. In 60 minims of boiled water are dissolved three-eighths of a grain of sodium arsenite and 1½ grains of sodium of chloride. This solution is painless, unirritating, and never causes abscess. As in the former form of medication, these injections should be continued for a year.

Mechanical treatment of the active kind is best in all cases. The patient must be encouraged to help himself. Passive exercise is demoralizing because it produces apathy and engenders an expectation of improvement that does not come. The principle to be impressed upon the minds of the afflicted is that rest for a limb is harmful. Rest in bed aggravates the disease by favoring immobility of the joints. Daily exercise is beneficial, though productive for a time of pain and discom-

fort. Daily walks and rides, household and other manual occupations are necessary in the mild forms. For the severe and advanced stages, the use of dumb-bells and calisthenic exercises to give strength and vigor to the upper extremities; daily locomotion with regulated and increasing distances for the lower limbs. Where there is much impairment of function in knees or hip, this exercise must for a long time depend on the aid of crutches or stout walking cane. A valuable means of restoring the power of locomotion when abolished through partial anchylosis and muscular atrophy is the daily use of the pedals or an ordinary bicycle secured to the top of a short upright bar or post. The patient seated upon a chair or astride a trestle, can, by making the pedals revolve with his feet do much to accomplish improvements and cure. In many cases the radius of excursion in the patient's limbs is so restricted in the beginning it will be necessary to secure the pedals nearer to the central axis than is found in the contrivance employed. The shafts therefore are perforated with holes at regular intervals into which the pedals when screwed make the rotations larger or smaller. At first also it may be necessary to secure the subject's feet with straps to prevent them from slipping, or else to hold them by hand until sufficient voluntary control of motion is acquired.

The dietetic treatment is of great importance. The diet should be varied, liberal and mixed, consisting in the daily use of meats, fowl, game, fish, eggs and all varieties of vegetable food. The patient's appetite must be tempted and whetted by gastronomic and culinary art. In addition to three regular meals a day, the consumption of three or four pints of milk at other hours, and at night, is the best of means for improving strength and weight. Dessert is forbidden, and fruit particularly does harm, with the solitary exception of the water-melon. Alcoholic drink, malt liquors, wines, and the stronger spirits should not be allowed. An intestinal irritation, with palling of the appetite is the objectionable feature of fruit eating; a gastritis or hypernemia of the stomach the reason for not allowing strong drink. With these restrictions the patient is encouraged to enjoy the pleasures of the table, and

he should be impressed with the maxim that poor man's gout can be cured only with the rich man's board.

Local applications are of temporary value and purely anodyne. Probably the best of its class is the emplastrum hydrargyri, U. S. P., the action of which on both local pain and stiffness is marked. In the disease of the vertebral column and sacro-iliac and sacro-coccygeal articulations its benefit is decided. It may be freely used, as toxic symptoms of mercurialism do not occur.

From other treatments than that here described the writer has seen no good results and sometimes evil ones. The hot-air treatment, general and local, electricity, galvanic, faradic and static, electric light bath, poultices, hot-sand bath, mud bath, hot bath, cold bath; ice frictions, Roentgen rays, massage, all of these do not cure arthritis deformans, and they entail expense, inconvenience and loss of time without compensatory benefit. Ocean voyages, various health resorts and mineral springs—arsenical; iron, sulphur, saline and alkaline—are so restricted in their usefulness, when we consider the immense number of the victims of this disease in the world, that to hold such resorts a means of cure looks pitiful. Our remedies for the treatment of articular rheumatism and gout do harm when given in arthritis deformans. The syrup of ferrous iodide, recommended by A. E. Garrod, may possess some virtue, but cannot be compared to arsenic when used as here given. Good authorities praise elementary iodine, and also sulphur, but both are feeble props in aiding those who have this disease.

With the means here described arthritis deformans can often be cured; at times the results are rapid and brilliant. The gloomy prognosis which overhangs the staid and erudite descriptions in our medical literature is founded only on the natural termination of a disease process which has run its course, unopposed by appropriate treatment.

The following papers were read by title: "The Therapeutic Value of Mechanical Vibration," by DR. H. L. TAYLOR, New York; "Medical Treatment of Cancer," by DR. R. REYBURN, Washington.

RECENT ADVANCES IN SPECIAL THERAPEUTICS.

PROGRESS IN AURAL AND OPHTHALMIC THERAPEUTICS.

Dr. D. B. St. J. Roosa, New York:

AURAL THERAPEUTICS.

It can hardly be said that any very striking progress is being made in aural therapeutics at this moment. The drugs used in the ear, either in the external auditory canal, the Eustachian tube, or the tympanum, for the cure of swelling or suppuration, have not been marked by many changes, except that argyrol is, in many instances, taking the place formerly held by silver nitrate. The methods of operation for mastoid disease, infections of the jugular vein, and for the radical cure of chronic suppurative otitis are being perfected. Possibly in the matter of mastoid disease no better results have been attained than twenty-five years ago when only urgent and pre-eminently fit cases were operated upon. But since aseptic methods of treatment have been everywhere adopted, operations are very properly performed upon cases which were formerly abandoned to their fate. The after-treatment is now simplified and perfected. The greatest progress has been made in endeavoring to secure healing by first intention in part and by a rapid and healthy granular process for the remainder. As to the Stacke radical operation for cure of chronic suppuration of the middle ear, many obstacles are met to the general employment and complete success of this method. It is an operation not without danger, and it is not always certain that the end of completely removing the suppurative process will be always attained, as the result of the attempt to convert the tympanum and auditory canal into one cavity, lined by cicatricial tissue. There is no doubt in the mind of the writer that operations for mastoid disease and a radical cure of chronic suppuration, have far outgrown the general professional knowledge of the proper treatment for acute inflammation of the middle ear. Anyone who will take a cursory look at the later aural treatises, and read the transactions of aural socie-

ties, will see that there is a great poverty of instruction and relation of experience as regards the treatment of acute inflammations of the Eustachian tube, the tympanum and the mastoid. It should not be forgotten that all these inflammations run into each other, and that no line of demarcation can, as a rule, be drawn between them. There is no part of the practice of medicine that will more rapidly and thoroughly respond to treatment than acute aural disease when managed by a stay in bed, in a warm room, with local blood-letting and irrigation, assisted by continuous applications over the mastoid of such a fluid as the acetico-tartrate of alum. In the same way, the man who learns how to thoroughly clean a chronic suppuration of the tympanum, and finally teaches it to his patients, will in very many cases cause the discharge of pus to cease without operation; and in others, where it might be dangerous to interfere, he will enable the patient to keep the ear in an aseptic condition, which, if thoroughly done, will obviate the necessity of an operation, for the latter, although if successful it may end the discharge forever, will generally destroy the remaining hearing. Before the drumhead is bulging and the mastoid tender, leeches will do as much to prevent the occurrence of meningitis as will any opening into the bone, which has not yet begun to suppurate. It is a very sad fact, however, that in a very small proportion of cases an acute otitis media—so thin is the roof of bone separating the tympanum from the dura mater—is a meningitis from the start, as Troltsch long since observed; and there are also cases where the mastoid bone breaks down at a very early period, but usually there is ample opportunity to be sure before operating that the mastoid is softening or suppurating. Dr. Roosa's experience of last winter, both in hospital and private practice, has only confirmed his formerly expressed opinions, that want of early and raical treatment for acute otitis media is the chief cause of the necessity for mastoid operations. As to the chronic non-suppurative processes in the Eustachian tube and tympanum, the greatest progress has been made in the last few years in determining the origin of these conditions in the nose and pharynx, and in operations upon adenoid growths;

so that the next generation will not suffer probably as this one has. But in the treatment of chronic catarrhal and proliferous inflammation, that has once set in, no substantial advance has been made over the ordinary local treatment through the Eustachian catheter, by Politzer's method of inflation and the masseur, with great care of the general condition. It is folly to attempt to relieve such chronic cases by operation upon the turbinated bone.

OPHTHALMIC THERAPEUTICS.

In turning to the progress in ophthalmic therapeutics, our strain is somewhat the same as that in aural. It is hardly likely that there will ever again be such an epoch-making period in ophthalmology as that which produced about sixty years ago the ophthalmoscope, the ophthalmometer, and the discovery of hypermetropia and astigmatism and the classification and means for the correction of the errors of refraction. After a good start, but subsequently a great deal of wandering through the desert, we have reached a habitable land, where the refraction of the eye is studied and corrected in a simple and successful way. There has been much unsuccessful work on the management of muscles by prisms and tenotomies, a departure from the principle laid down by Donders and never overthrown, that in the fixed, static conditions of the eyeball must be found the causes of asthenopia. But except in very few quarters, corneal astigmatism and hypermetropia are again considered the chief causes of inability to continue to use the eyes without correcting glasses, and myopia is properly regarded as essentially a diseased condition of the eyeball, not a frequent source of asthenopia, unless associated with astigmatism, to be treated fearlessly as to its correction, with concave or concavo-cylindrical glasses, when united with astigmatism, but with great caution as to its hygienic management and general outcome. Especially in this country, the most extravagant claims have been made for the dependence upon errors of refraction and want of proper muscular balance of the ocular muscles a large variety of diseases, such as migraine, epilepsy, chorea, and even idiocy. Lately one author goes

very much farther than all this, and in two interesting volumes, traces the dyspepsias, discomfort, and diseases of Thomas Carlyle, George Eliot, Francis Parkman, Richard Wagner, De Quincey, and almost a score of others, to the want of adjustment of proper glasses. But these volumes have not served to convert many beyond the author, who seems to be able to accomplish the cure of migraine, with absolute certainty, by the proper adjustment of glasses. But, since he gives sixty-eight reasons why glasses did not give relief, it is to be feared that it is a gift granted to but few, that the coming generation will lose the art, and that again a Carlyle, a Coleridge, and a Parkman will continue to arise and struggle through their lives with manifold woes, just because they have not had eye glasses properly adjusted by one of the few men who knows how the work should be done by tests that do not involve the use of instruments. Certainly in New York we have failed to cure epilepsy, chorea, and migraine either by tenotomies or by correction of the error of refraction. In this most of our neurologists and ophthalmologists agree. Eyestrain, so-called, a name which has been terrifically abused, may cause headaches, and blepharitis, styes, and fatigue of the eyes, and even low spirits, but these symptoms, when thus caused, are easily recognized and readily relieved. But that the human character can be transformed, and the misery of the great minds of the world entirely remedied, in many of whom a gentle melancholy seems to be an accompaniment of genius, is not yet to be believed. It is difficult to be serious in the light of such extravagant claims, but the student of ophthalmology, with a large hospital practice, whatever vast ideas he may have of the incomparable power of glasses to relieve all kinds of suffering, will soon come down to the more modest proportions of the masters of this science, who passed over these great discoveries without having once suspected that they were to be made, who found very few but local bodily ills from the non-use of glasses.

The good work in trachoma continues. A new addition to the means of treatment is found in the X-ray, which, although requiring more time than the operations of expression and

gratage, is thought by some to diminish the tendency to cicatrization, and the necessity for long, continued treatment. Radium also is beginning to be used for the same conditions, but the hopes entertained chiefly by the writers for the daily press of its value in as yet incurable diseases of the optic nerves and their cerebral centers and points of origin, have not been realized. Very lately Abadie has reinvestigated the subject of tuberculosus iritis, and from several successful cases he believes that with the administration of eugenol iodide, combined with meat food and carnine, Lefranq will not only cure tuberculosis of the iris, but also hold out something for pulmonary tuberculosis.

Great activity is to be observed along the whole line of ophthalmic workers. Asepsis has converted its operative field, especially as to the extraction of cataract, into a most satisfying and productive region. In glaucoma, sympathectomy makes slow, if any progress, but strong solutions of eserine in oil have proved very efficacious in the hands of a few, in inoperable and incurable cases, as well as in chronic cases with subacute exacerbations, while in acute glaucoma iridectomy remains where Graefe placed it. Strabismus and its treatment now receives thorough study as to its etiology and treatment. It is more often cured by the use of glasses than ever before, while in these selected cases in which operations must be performed to correct the deformity, and in some instances to secure binocular single vision, the results are highly satisfactory.

RECENT ADVANCES IN SURGERY.

DR. C. BECK, New York: While surgery has to report no epoch-making discovery of recent date, many improvements have been made on some of our older methods. For treating congenital fistula of the neck König advises first mobilizing the fistula by dissection to a point above the digastric. It should then be liberated by the finger to a point close to the mucous membrane of the mouth by dissecting bluntly, the oral cavity being kept wide open by a Whitehead speculum. A curved probe is now introduced into it through the wound to a

point very close to the tonsil. Then the mucous membrane of the oral cavity is incised and a silk thread fastened to the external end of the fistula. Now the mobilized fistula-tract can be pulled into the oral cavity, where it is fastened to the wound margins of its mucous membrane. The projecting part of the fistula is then removed. The connection between the integument and the fistula is thus cut off, and the remainder of the latter simply represents a harmless opening in front of the tonsil. The same method can be utilized in blind internal fistula.

The use of the bronchoscope for extracting foreign bodies has proved to be extremely valuable. Garel, of Paris, reports the case of a young woman who, three months previously, had aspirated a steel pin with a glass head. Kilian's bronchoscope was introduced through a tracheotomy opening, and by its aid the pin was seen, point upward, in a bronchial tube of the third order. It was extracted by a forceps. (The bronchoscope is much more useful after several skiagraphic exposures have been made.)

One of the most remarkable advances of recent date is represented by Sauerbruch's air-chamber, which eliminates pneumo-thorax in the intra-thoracic operations. This is done by excluding the atmospheric pressure during the operative procedure, thus preventing collapsing of the lungs after being opened to the air. In a lower animal Sauerbruch opened the thorax on both sides, and removed sternum and ribs without seeing the respiration interfered with in the slightest degree. The Sauerbruch chamber is air-tight. Its size permits of the presence of surgeon, assistant, patient, and operating table. The head of the animal may project outside, while a rubber-cuff is tightened around his neck. Regulation of the air pressure is done by an air-pump, a valve in its wall permitting the entrance of a sufficient amount of air to keep up continuous negative pressure inside the chamber. Professor von Mikulicz and his assistant, who did some work inside of the air-chamber for an hour, did not suffer any discomfort. The chamber is composed of boards, which are lined with tin, soldered at the corners. The roof is made of glass.

In the surgery of the biliary passages many valuable contributions have been received. The admirable work of Kehr and Mayo deserves special attention. One of the remarkable events was the successful removal of an aneurism of the hepatic artery by Kehr.

Interest in the various types of appendicitis and the technical steps of appendectomy is still undiminished, and it is interesting to note that American doctrines are more and more adopted in Europe, as far as the pathology of the vermiform process is concerned. Many of these European surgeons who used to ridicule the "American hyperactivity" are now enthusiastic advocates of early interference in appendicitis, and this number is growing larger from day to day.

In order to facilitate operative procedures in the hypochondriac and epigastric regions, Marwedel tried to turn up the rib-arch, considering that the rigidity of the thoracic margin interferes with the access to the superior hepatic surface. The same applies to the lower portion of the esophagus and to the dome of the diaphragm. The *modus operandi* is as follows: By a curved incision, running parallel with the costal margin, and extending from the xiphoid process to the tenth rib, the abdominal wall is divided. The rectus muscle as well as the external oblique are separated from the internal oblique and the transversalis. The cartilage of the seventh rib now comes in view, and is divided at its sternal junction. In the same manner the junctions between cartilages and bone of the eighth and ninth rib are exposed, and divided by blunt dissection. By retracting the loosened portions of the ribs and the soft tissues over them over the chest, access is now gained to the hypochondrium. The same principle of procedure can be utilized on the left side for approaching the cardia and the upper part of the stomach.

The disturbance caused by adhesions and peritoneal bands has recently received more thorough attention. Lejars, the excellent French surgeon, has made a special study of these important conditions, which frequently show their clinical manifestations by such vague functional disorders that they may not be recognized. The patients are often regarded to be neu-

rasthenics. Later, pain may be a predominating symptom, and finally, even strangulation may be produced. Sometimes after an apparently slight abdominal injury, vomiting, pain, colicky attacks, and symptoms of obstruction may turn up. Exploratory laparotomy will clear the situation, and detaching or excising the constricting bands will promptly remedy the disorders. Lauenstein and Gersuny have also published similar experiences. The symptoms observed by the various authors were either gastric, intestinal or pelvic. The impression was always that there was some obstacle in the intestine and that painful distention took place above the obstacle. Medication was always unsuccessful. These cases frequently simulated chronic constipation, enteroptosis and pelvic neuralgia. Sometimes they were, as the autopsy table showed, taken for ulcer or carcinoma of the stomach, or cholelithiasis.

The principles observed by Mayo in his pylorectomies are also noteworthy. Of his 41 cases, 37 were performed for carcinoma and four for inveterate ulcer. His steps are as follows: "After opening the abdomen doubly ligate and divide the gastric artery, then ligate and divide the necessary amount of gastrohepatic omentum close to the liver, leaving most of its structure attached to the stomach. Doubly ligate and divide the superior pyloric artery and free the upper inch or more of the duodenum. Then with the fingers as a guide underneath the pylorus, in the lesser cavity of the peritoneum, ligate the right gastro-epiploic or gastroduodenal artery, and progressively tie and cut away the gastrocolic omentum distal to the glands and vessels up to the appropriate point on the greater curvature, and here ligate the left gastro-epiploic vessels. Then double-clamp the duodenum purse-string, divide between with the cautery, leaving one-fourth inch projection. With a running suture of catgut through the seared end the duodenum is closed as the clamp is removed, and a purse-string suture about the duodenum enables the stump to be inverted. The proximal end of the stomach is double-clamped along the Milkulicz-Hartmann line and divided with the cautery, leaving one-fourth inch projection. Suture through the seared stump with a catgut button-hole suture. This is again turned in after

removal of the clamp by a continuous silk or Cushing suture. Finally follows independent gastrojejunostomy."

The value of subcutaneous feeding in such disturbances of the gastro-intestinal tract, in which nutrition by mouth or rectum has become impossible or is contraindicated, is proved by Friedrich, who injects 40 to 100 grams of grape-sugar in a three per cent. solution per diem. Recently he also tried the pure pepsin-peptone, free from albumoses. A useful combination consists of two grams of grape-sugar, two grams of table-salt and four grams of pepsin-peptone to 100 grams of water. Especially in very severe disorders, like perforation of the stomach or intestine or severe peritonitis subcutaneous feeding is apt to tide the patient over the critical period. Similar good results were obtained by Credé in using a meat preparation which contains soluble albumin in a readily assimilated form, 95 per cent., and traces of iron and salt, two per cent. This preparation, called kalodol by him, resembles the albumin in the circulation. This explains why it is so easily assimilated. About four kalodol injections per diem suffice for a patient. Rectal injection of kalodol may also be resorted to, as it is easily absorbed.

Chaput is in favor of performing capital operations on the abdomen under local cocaine anesthesia. He resorts to general anesthesia only when the patient is timid. He performed gastroenterotomies, appendectomies and hysterectomies, under cocaine anesthesia.

To intensify the resistance of the peritoneum against infection, von Mikulicz advises the internal administration of acid of nuclein, which is supposed to increase the number of the leucocytes, thus rendering bacteria innocuous. In suppurative peritonitis Küster places the patient in the abdominal position, in order to facilitate the discharge of the exudate from the area of operation.

Kapsammer's observation, that the freezing point of the urine may be influenced by reflex polyuria from catheterization of the ureters, is noteworthy. The results of this new method should, however, be taken *cum grano salis*. In one of his cases of renal tuberculosis, for instance, there was five per

1,000 albumin, and the freezing point of the urine was 52 degrees C., while that of the blood was 58 degrees C. Despite this fact nephrectomy was performed, the albumin disappeared and the patient recovered. Kapsammer pleads for catheterizing both ureters in order to arrive at a correct diagnosis, and is also in favor of employing the phloridzin and methylene blue functional tests as well. One case of tuberculosis of the bladder was cured by the local use of bichloride of mercury in combination with guaiacol-iodoform. In bilateral tuberculosis it is often found that a slightly affected kidney recuperates after the removal of the diseased mate.

On the basis of 79 cases of osteomyelitis and 108 osseous tuberculosis, von Mostig-Moorhof recommends filling up osseous cavities with iodoform. In some cases of osteomyelitis of the tibia he removed the tibia in its entirety and filled the resulting defect with his "Iodoform-plombierung." As is well known, iodoform is not absorbed by dead bone, but only when it is reached by the new growth of osseous tissue. Thus absorption of the iodoform takes place so slowly that the danger of intoxication is small. The process of healing can be studied by skiagraphy.

While many interesting experiments have been made on the carcinoma question, nothing new has been derived from them. Doyen claims to have isolated a bacterium, which he calls theMicrococcus neoformans. He obtained vaccines and toxins from it. He has treated 126 cases so far, 21 being cured and 47 improved. In 58 patients there was a negative result. Eight months of cultivation are necessary for the production of an effective toxin. So far Doyen's observations were not corroborated by other investigators. The observation that epithelioma may be produced by continued exposure to the Roentgen rays is not in favor of bacterial origin, but of the irritation-theory.

Literature upon the application of the Roentgen rays in surgery has increased remarkably. The representation of renal calculi has become a reliable method in the hands of the expert. Reports on the successful skiagraphy of biliary calculi have also become more frequent. The therapy of fractures is much

simplified and perfected since the Roentgen guide shows the true nature of the conditions. Irreducible fractures are now operated upon early instead of waiting for the development of a conspicuous deformity, which at a late stage cannot be corrected as well as at any early period of the injury. The knowledge of the various diseases of the bones has been much augmented, and new laws of differentiation between inflammatory, syphilitic, tuberculous or osteomyelitic processes, and osteoma, osteosarcoma and osseous cysts have been established. The indications for the therapeutic utilization of the Roentgen rays have become clearer, and great efforts are made to keep facts and conjectures well apart. While there are many encouraging results reported in some malignant diseases, utopistic views should not be held, and it must always be kept in mind that this new and delicate field is still in a stage of development. Radium has become a competitor of the Roentgen rays in this respect, but, while it has some advantages over the Roentgen rays, as a whole, it has so far proven to be of limited practical importance. Its undoubted advantage over the Roentgen rays is, that it can be placed into mucous cavities, like the nose, esophagus, stomach, uterus, urethra, etc. The small size of the radium tubes also permits of imbedding them within the tumorous tissue through an opening made by puncture. The radium treatment may also be tried in cases in which the Roentgen ray treatment has proved to be unsuccessful. As a diagnostic means the radium in its present form cannot be used in practice. The Finsen method, ingenious as it is, can, in its present state, not compete with the Roentgen treatment. It should, therefore, be resorted to in cases only in which the Roentgen ray or radium treatment has proved to be unsuccessful. A variety of new and useful apparatus has been invented, among which may be mentioned the compression-diaphragm, the various skiameters, the osteoscope, and the non-penetrable glass apparatus of Kohl, which shield the operator.

What may sometimes be done with the Ronetgen rays is illustrated by this lady (demonstration) who was presented in this room two years ago, shortly after operation. She showed

the first signs of sarcoma of the orbit nearly three years ago. Enucleation of the eyeball was undertaken, but the recurrence in the frontal bone took place three months thereafter, and finally reached such an extent that it was regarded as inoperable. After having ascertained the extent of the growth of skiagraphic exposure, I removed the diseased bone portions. Three weeks thereafter, when cicatrization had taken place, irradiation was begun three times a week, exposing the patient ten minutes each time. No change was observed during two months' treatment. But when irradiation was stopped for three weeks, the signs of recurrence again appeared, the vicinity of the orbit projecting far. Now Roentgen irritation was resorted to every day at small distance, low vacuum and high current being chosen. After eleven exposures extensive dermatitis developed, which proved to be of the ulcerative type, within the center of the irradiated area. At the same time complete alopecia of the diseased side set in. The patient suffered considerably for a week, then the symptoms gradually subsided. The treatment at first consisted in the application of Burow's solution, and in the use of xeroform gauze later. Three weeks after the beginning of the vehement dermatitis all signs of the carcomatous infiltration had disappeared, especially the projection, and the general condition of the patient improved remarkably. With few intermissions light Roentgen treatment (twice a week) was kept up until to-day, that is, two years after the operation. There is still a slight projection in the orbital region, which, however, appears to be composed of normal tissue. It is interesting to note that the scar produced by the incision, has completely disappeared after the dematitis. So, instead of disfiguring the patient, the burn has in this instance served as a beautifying agent. Whether or not a recurrence will take place in this case cannot be determined; still, after the lapse of two years this does not seem to be probable. The general condition of the patient is undisturbed. Of course, we must not generalize from one case. There are cases of sarcoma in which the Roentgen rays show no inhibitory action at all, while others of the same variety react at once and markedly. Clinical experience indi-

cates that the results in round-cell sarcoma are better than in the other types. Other factors are to be considered, too; for instance, the general composition of the growth and the region. My experience shows a larger percentage of improvements in sarcomas of the face than of the extremities. Of course, whatever can be reached by the surgical scalpel should not be left to the rays, the latter to be employed largely after operation or in inoperable cases.

As a counterpart of the favorable case just shown, this case of a man, aged fifty-eight years, may serve [demonstration]. His history reveals that two years ago he noticed a hard swelling above the right gastrocnemius muscle, which was painless at first; but after having slowly increased in size, there was considerable discomfort while walking. A year ago I made an extensive extirpation of the growth, which at this time had reached the size of a man's first, at the Post-Graduate Hospital, removing a considerable portion of the gastrocnemius muscle at the same time. Three weeks afterward Roentgen treatment was begun, but the patient became negligent until four months after the operation a recurrence formed in the scar. Irradiation was taken up then for a short period, during which about a hundred metastatic nodules formed on his trunk, face and extremities. Microscopical examination, made by Dr. Henry T. Brooks, showed the presence of round cells. The patient begins to present the signs of cachexia now. He is taking Fowlers' solution, but nothing seems to arrest the metastatic process.

RECENT ADVANCES IN ORTHOPEDICS.

DR. R. A. HIBBS, New York: In selecting a subject for this paper it seemed to me that I could do no better than call the attention of this Association to a work now being inaugurated by the New York Orthopedic Dispensary and Hospital, in the establishment of a country branch and industrial school, as representing a distinct and important advance in the therapeutics of Orthopedics. The resources offered for the treatment of orthopedic patients in our city hospitals and dispensaries are not sufficient to meet the necessities for securing the

best results in a large percentage of these patients. The duration of traetment is long, it is unwise to keep them in such hospitals for long periods of time, and when they are returned to their homes and to a dispensary service they cannot be given the proper surgical care; nor do they have the kind of food or healthful surroundings necessary to securing the best results. So it has seemed wise to those interested in the promotion of this work to establish a place in the country where those children, for most of our cases are children, requiring continuous treatment for long periods, might reside under the most healthful conditions and where there would be no abatement in their surgical care. In carrying out this plan it was necessary to have several considerations in mind. First, it was important for such a place to be near the parent institution, the City hospital, so that the surgeon's care might be uninterrupted, and his visits frequent. Second, the location should be in the most healthy surroundings, where there was the greatest abundance of pure air and sunshine. After looking over the situation pretty thoroughly with these considerations in mind, a site was selected two and a half miles out from White Plains, in the country, and five miles from the Long Island Sound. A plot of 14 acres at an elevation of 300 ft. was purchased, and here the institution stands. Its capacity at present is fifty and the cases are to be convalescent ones. They are to be under the immediate care of a resident surgeon and are to have the uninterrupted observation of the staff of the City hospital. Since the work has to be confined to children and their stay will be during the time when their education must be secured, the educational feature of this work is to be most important. The education of a crippled child should be accomplished under the supervision of the surgeon, and it may be done without in any way sacrificing the success of his work. Indeed, unless this is done, it is quite probable that the success of the surgical treatment of the patients may be seriously hampered or entirely sacrificed to that of their education. The two, surgeon and educator, must work together, the former always guiding the latter in the amount and character of the demands made upon the individual in the promotion of his education. A large

percentage of the cases treated in orthopedic hospitals and dispensaries are those suffering from joint tuberculosis, and as this class is the one most needing the sort of surroundings mentioned, pure air, good food, and sunshine, which are offered here, a large proportion of the cases will be of this class.

It is safe to say that the cure of joint tuberculosis under such conditions will be accomplished in a much shorter time than is now possible, that relapses, now so frequent, will be much less so, and the cure more permanent. From the nature of the disease, those children suffering with it demand our most immediate and continued relief, and their numbers are such that a large part of our resources are used in their treatment, while the large number of those suffering from non-tuberculous conditions cannot be given the proper consideration or the careful treatment which they require. It is the experience in most orthopedic clinics to see an amount of time given to the treatment of joint tuberculosis cases out of all proportion to their number, and such as, with a necessarily limited staff and resources, to make it impossible to give the proper care to those cases suffering from non-tuberculous conditions, whose necessities are great and will respond rapidly to more thorough methods of treatment. For instance, where is there a clinic where the thorough treatment is given cases of lateral curvature of the spine which is needed in that most distressing deformity? What institution has the facilities of a staff with sufficient time? It is not so at the New York Orthopedic Dispensary and Hospital. These patients are now coming to us earlier in the stage of their deformity, thus presenting opportunities for obtaining better results than have been heretofore seen. And then there is the large field of orthopedic work among adults, which heretofore, at least in this city, has not been thoroughly developed. Dr. Willard will soon have a similar work in operation near Philadelphia, and it is to be hoped that the time is not far distant when all City orthopedic hospitals will have their Country Branch, which will undoubtedly meet the greatest necessity in the treatment of a large class of orthopedic patients, namely, those suffering from joint tuberculosis, and in relieving our City hospitals

of their continued care will secure for the large numbers suffering from non-tuberculous affections more efficient treatment.

RECENT ADVANCES IN GENITO-URINARY SURGERY.

DR. J. PEDERSEN, New York: Advances follow the line of greatest activity; we have therefore but to look for the latter to find the former. Even a cursory inspection of any index of genito-urinary surgery for the past year shows that the center of greatest activity has been the surgical treatment of hypertrophy or enlargement of the prostate. On closer inspection the advances may be traced in two directions: First, in the choice of the operation; second, in the technique of the operation chosen. Prostatectomy has been fixed upon as the operation of choice; but such authorities as Bangs, Willy Meyer, Thorndyke, Young, MacGowan, Orwille, Horwitz and others still find that Bottini's prostatotomy or one of its modifications has "a very real surgical value" in a class of cases well described by Thorndyke as "bad surgical risks, for whom catheter palliation has come to an end or is inapplicable." To-day's position is, therefore, this: When catheter palliation has come to an end, the contraindications forbidding prostatectomy become the indications for galvano-cautery prostatotomy. MacGowan summarizes the contraindications thus: "a tendency to bleed freely from very slight injuries; the existence of serious heart lesions accompanied by a great muscular feebleness, and (most important) the inability of the kidneys to secrete a reasonable quantity of urea, namely, from 15 to 25 grammes per diem." Murphy's only contraindication is "severe arteriosclerosis, with cardiac changes." Age taken alone is not a contraindication. There is a concensus of opinion that, while perineal prostatectomy is preferable, suprapubic prostatectomy still has a place, and is indicated when the cystoscope shows large intravesical out-growths. In the technique of perineal prostatectomy we note as an advance that exposure of the prostate is finding greater favor, and that both the transverse incision (straight or curved) and the inverted Y, though they have authoritative advocates, are giv-

ing place to the median vertical incision. The incision is carried down to the apex of the prostate, which is then exposed by blunt dissection and a stretching of the wound. The membranous urethra is then button-holed. While some operators prefer to draw the prostate down into the wound by means of the finger introduced into the bladder through the opening in the membranous urethra, others prefer metal retractors or tractors, such as Young's. Still others draw the prostate down by means of more or less specially devised tenaculæ and do not open the membranous urethra. Perineal prostatectomy with exposure of the gland has these advantages over suprapubic prostatectomy: less hemorrhage; the guidance of sight; perfect drainage; convalescence is shorter. and the prognosis as to life and ultimate result is better. Prostatectomy to-day does not mean the total removal of the gland, "but the removal of such tumors as can be shelled out or, if necessary, cut out (piecemeal) in order to clear a channel for the free passage of the urine." For draining the bladder after perineal prostatectomy, MacGowan uses a short metal tube in calibre 36 F., with a large eye and made to fit the Chismore evacuating bulb, by means of which blood clots of any size may be pumped from the bladder at any time. A new device for controlling alarming hemorrhage after suprapubic prostatectomy is presented by Sir W. Thompson. It consists of a disc of flexible rubber, one-sixth of an inch thick and two inches in one diameter by 1½ in the other. To the center is attached a strong silk suture, which, fastened to a catheter, is carried through the length of the urethra by retrograde catheterization. Traction on this suture draws the disc forcibly against the internal urethral orifice. The disc being smooth does not adhere to the surrounding tissues and is easily removed by drawing on a second silk suture that was passed through the disc near its edge and left hanging out of the suprapubic wound. An interesting procedure is that reported by E. Goldman. Arguing that the improvement which sometimes follows suprapubic puncture is due to an obliteration of the post-prostatic pouch caused by a lifting upward of the bladder by the adhesions excited by the puncture, he has performed ventrovesico-fixation

with some success. Because of the part their work plays in preventive medicine, we must note as an advance the recent work by Ciechanowski, Greene and Brooks, Crandon and others, on the etiology of prastatic enlargement. As yet there is no agreement between these observers, excepting in the denial that arteriosclerosis is a cause; but the weight of evidence is in favor of an inflammatory hyperplasia, be the cause of the inflammation what it may. Some observers say that the gonococcus is the most frequent cause of the inflammation, but others fail to corroborate this.

That much is being done in that vital and attractive field, the surgical treatment of chronic nephritis, may be deduced from the comprehensive paper by Guiteras (*New York Medical Journal,* November 7 and 14, 1903), in which he gives an exhaustive analysis of 120 operations collected from literature. His conclusions from these are as follows: Chronic nephritis should not be operated upon until medical treatment has proved of no avail. Operation is indicated when it is noticed that the process is advancing rapidly and it is feared that the heart will soon become overtaxed. The operation for chronic nephritis which has proved least dangerous, and which has shown the best results, is nephropexy performed on a single movable kidney. The most unfavorable cases for operation are those of diffuse nephritis. Cases of general anasarca, with bad heart action, should not be operated on; but if the heart action is good, an operation performed as a last resort may give the patient a few extra months of life. Where there has been a marked destructive process in the kidneys, as a result of nephritis, the operation may give relief for a number of weeks or months, but these patients generally fail again and die when the new capsule begins to contract.

A. H. Ferguson believes that "decapsulation in acute, subacute and chronic nephritis, both interstitial and parenchymatous, is a practical and effectual procedure, but not a panacea." A. T. Cabot, arguing by analogy from the results obtained in the acute and subacute conditions, says, "it is reasonable to suppose that benefit will follow if the operation (decapsulation) is performed early, rather than as a last resort." An

important paper on this subject is that by Edebohls (*New York Medical Journal*, May 21, 1904), in which he says that renal decapsulation has been practiced so frequently for chronic nephritis that the expression has come to be synonymous with the surgical treatment of that lesion. There are other conditions for which the operation has been performed, however, namely: Acute nephritis, acute pyelo-nephritis with miliary abscesses, hydronephrosis, pyonephrosis, polycystic degeneration of the kidneys, puerperal eclampsia of renal origin and acute suppression. His explanation for the immediate beneficial effects following decapsulation is the massage which the kidney receives incidentally during the operation, supplemented by the abstraction of more or less blood from the organ; that for the intermediate effects is drawn from the "advanced experimental work of Flexner, which appears to indicate that the most virulent of the nephrotoxins are formed in the comparative blood-free cortical portion of the kidney;" while the explanation of the ultimate result is the formation of a new capsule. Continuing, Edebohls says: "After decapsulation of normal or of acutely inflamed kidneys in the majority of animals of various species, the preponderance of evidence thus far is clearly in favor of the formation of new vascular connections between the surrounding tissues and the kidney; but because of the difficulty of exciting a chronic nephritis experimentally, evidence is lacking as to the behavior of a chronically inflamed kidney under the same conditions." With reference to this question in the human subject, Edebohls quotes the only two autopsies recorded as having been performed some time after the operation of decapsulation, and adds one of his own. In the first two a new capsule is reported but the much desired details are wanting. The autopsy in his own case, performed four months after decapsulation, shows in serial sections the existence of an abundant vascularization of the new capsule, of direct connection between the vessels of the new capsule and those of the perinephritic fat, and of direct penetration of the newly formed vessels of the new capsule along connective tissue paths into the substance of the kidney; thus affording as clear a corroboration as could

be desired of the probable correctness of the observer's (Edebohls) working theory of the formation of a new and increased blood supply to the kidney after decapsulation. In final refutation of the objection that the new capsule will contract and cause further lesion of the kidney, Edebohls refers to three patients still under his observation, whose kidneys he decapsulated unintentionally ten years ago while performing nephropexy. These three patients are in excellent health, and the urine of each is perfectly normal. Furthermore, he quotes Rose, who, as a routine measure, completely decapsulates every kidney upon which he performs fixation. Twenty of his patients operated upon from three to fourteen years previously, were found with absolutely normal urine. In a subsequent paper, though published on the same date (*Medical Record*, May 21, 1904), Edebohls discusses redecapsulation and reports the only case on which he has had an opportunity to perform this operation. In the conclusion of this paper Edebohls says: "The main and most frequent indication for renal redecapsulation in chronic Bright's disease will probably remain a return or an exaggeration of the clinical symptoms after a more or less protracted period of improvement following a first decapsulation. This indication does not embrace the transient acute exacerbations so frequently observed in the course of chronic Bright's disease, whether the kidneys have or have not been decapsulated. It applies rather to those cases of uremia and of failure of kidney function characterized by a steady diminution of the amount of the daily output of urea, since the most striking and constant result of renal decapsulation for chronic Bright's disease is the increased elimination of urea. Suppression of urine is of course included in the indication." He notes with emphasis that the new capsules which had formed subsequently to the first decapsulation had not exerted any pressure on the kidneys, and he adds that "judging from the above solitary experience in the living and from an additional observation in the dead house, the removal of the new capsule presents no greater technical difficulties than the removal of the original renal capsule."

An advance in surgery of the seminal vesicles is apparent

from the original work reported by Fuller. It takes his operation of vesiculotomy out of the experimental stage and enables him to recommend its adoption. He adds 16 cases to the five reported by him in the *Journal of the American Medical Association* for May 4, 1901. The only change in the technique of his operation consists in placing the patient in a kneeling position on a flat table, the thighs at extreme flexion, and with the chest and one side of the face resting on the surface of the table. A new method of performing perineal urethrotomy without a guide in the urethra, for example in impassable stricture, has been devised by Gibson and employed by him with success. Through a rectal speculum he transfixes the prostate with a specially designed tenaculum, then removes the speculum. While an assistant drags the prostate downward and backward by means of the tenaculum, thus putting the membranous urethra on the stretch and making it cord-like, he cuts down through the usual median perineal incision, feels for the tense and cord-like membranous urethra and opens it just anterior to the apex of the prostate. The technique of the radical cure for variocele has been advanced by Potter's suproscrotal operation. It is performed through an incision 1½ inches long beginning at the external ring and extending downward over the course of the cord. When the cord is reached, it, with the vas. artery, nerves and pampiniform plexus are drawn through the incision. After the vas (with its artery) and the nerve have been separated out, the veins, spermatic artery and connective tissue are ligated above and below and excised. The stumps are brought into exact apposition and the wound closed. Potter makes a point of including the spermatic artery in the ligature on the rational ground, supported by authorities, that as the veins are suddenly obliterated it is consistent to limit the blood supply, especially as the anastomoses between the artery of the vas and the manifold arterioles of the scrotal sac, gradually assume the normal blood supply of the testicle. The chief advantages of this operation are: the relations are easy to make out and therefore less time is required; there is less oozing; it is easier to apply dressings.

Ureteral catheterization has attracted and received much attention during the past year. That it has replaced segregation is certain. Evidence proves that no form of segregator yet devised is absolutely dependable. It is to be feared, however, that ureteral catheterization is going through a transitional stage similar to that from which prostatectomy and prostatotomy are just now emerging. With greatly perfected instruments and improved technique it is highly probable that there exists at present an overzealous use of this valuable aid to diagnosis and tempting addition to therapeutic means. Kreissl (*New York Med. Journal,* February 13, 1904) sounds a warning note in this direction when, drawing upon his considerable experience, he says, "From my observations I have come to the conclusion that the efficiency of the ureter-cystoscope as a therapeutic means has been grossly exaggerated, although it can not be denied that when judiciously employed, it has its useful, but very limited sphere." Of happy significance are the statements, based on his own experience, that fistulæ following the various operations on the ureter and renal pelvis, will rarely be observed if a catheter is left in the renal pelvis and ureter for the first three days after the operation; also that certain forms of renal and ureteral fistulæ may be cured by prolonged drainage of the urine through a ureteral catheter, which may be left in place for several weeks if necessary without harm, provided the precautions of aseptic instrumentation have been strictly observed. Cryoscopy has advanced into recognition as an important aid in determining the functional integrity of the kidneys. Cattell, in a carefully collaborated paper, presents among other conclusions the following: "Cryoscopy has a valuable though somewhat limited use among laboratory methods in medicine. Its application is easy and the apparatus, if desired, can readily be taken to the house of the patient. Repeated cryoscipic examinations of the urine taken in conjunction with those of the blood, afford a valuable means of determining the presence or absence of renal and cardiac insufficiency, more especially if separate catheterization of the ureters can be practised. But in all doubtful cases cryoscopy should be supplemented by other well-known laboratory

tests." Kummel and Rumple agree with Cattell that ureteral catheterization is always necessary in addition to cryoscopy. Lower, in a discussion of the subject, concludes that the function of the kidneys is best determined, in order of importance: first, by the freezing point of the urine (urinocryoscopy); second, by phloridzin glycosuria; third, by the quantity of urine excreted; fourth, by the freezing point of the blood (hemocryoscopy).

A signal advance in that most advanced science, preventive medicine, is the work that is being done toward the prevention of venereal disease. The movements set on foot at home and broad in this most necessary direction seem to be full of prophetic energy. Segregation and licensing having proven their own futility, popular instruction and enlightenment are being championed as the only rational procedures today. A stable conviction in the medical mind to the effect that the venereal diseases are serious subtractors of the happiness, health and life of the community, and a well-organized, discreet and conscientious diffusion of knowledge, likewise to the point of conviction, in the lay mind of the present generation, it is believed, will start the necessary evolution.

RECENT ADVANCES IN THE THERAPEUTICS OF PEDIATRICS.

DR. NOBLE P. BARNES, Washington: The most eloquent argument that can be advanced in proof of the worthiness of this branch of the art, is the remarkable reduction in infant mortality in all civilization. Our large cities point with satisfaction to the decline in the death-rate of children in the last ten years, and further improvement may be confidently expected with a more thorough application of recognized knowledge. In this contest of human existence, much depends upon getting a good start, and some of these infants that are being saved have a hard struggle shaking off the iniquities of their fathers. Several conditions are prominent: (1) belated marriages result in diminished birth rate; (2) the increase of cancer is only among the nations in which the marriage age has been steadily advancing; and (3) the psychosis noticeable in a large percentage of children depends, not so much upon

school life, as upon inheritance and the nutritive process of the developmental period.

The medical inspection of schools has only begun to accomplish what is within its possibilities, and the future school will have its medical attendant who will not only exclude children suffering from contagious diseases and those who have other diseases rendering them too ill to remain in school, but will direct those mentally and physically defective, and determine the amount of school work a child is able to perform.

Experimental and clinical observations have served to emphasize many well-known facts respecting infant feeding. The danger from raw milk in the summer is conclusively demonstrated, and universal pasteurization is a most important factor in reducing infant morbidity and mortality. Behring and Richie argue in favor of using preservatives, and place especial stress upon formalin in from 1 to 500 to 1 to 10,000. Behring claims that formalin in these proportions is tasteless and harmless; that the curdling is more flocculent, the milk more digestible and the immune and antibodies unimpaired. Personally, Dr. Barnes has had considerable annoyance with milk containing formalin, making it impossible to put the milk through the first process of digestion. If, then, this formalinized milk resists the action of pepsin, the enzymes of the milk must also be destroyed, and its digestibility must be greatly impaired. The recommending of preservatives for milk is an exceedingly dangerous procedure, and its enactment would encourage careless and indifferent dairymen to deliver any amount of filth. Electrical preservation, now under experimentation, may clear this problem for the future. Just now we are most concerned in the production of a pure, clean milk and its adaptibility by suitable modification to individual cases. The selection and care of the milch cow, the handling of the milk, and its modification for the infant has been thoroughly presented to the profession, and the outline suggested by the United States Department of Agriculture for the improvement of market milk should be enforced by law. Buttermilk feeding has been revived, and its advocates believe it to be a life-saving prepar-

ation for sick children. Men frequently lose sight of the modification of sweet whey, which is the sheet anchor in digestive disorders. Usually when a physician vibrates from boiled flour and butter-milk to proprietary foods and condensed milk he demonstrates to everybody, possibly himself included, that as a baby feeder he is a failure.

The exact rôle of the Shiga-Flexner bacillus in summer diarrhea is still under consideration. The organism was found in 62 out of 64 consecutive cases examined at the Vanderbilt Clinic. Flexner and other workers in this field believe that the bacillus of dysentery produces the primary lesions early, and the subsequent pathological change is the result of a mixed infection. This being the case, the antidysentery serum of Flexner, in order to be of much virtue, should be given early and before the usual mixed infection and anatomical changes occur. Holt reports use of the serum in eight cases, two of which were moribund. In three no effect was seen, and in the other three improvement was strikingly apparent. Zahorsky concludes the report of his experience with the statement that monovalent antidysentery serum is too uncertain for general use, but the polyvalent serum should be given in all cases of summer diarhea. Hastings concludes his report of the *Bacillus dysenteriæ* in Boston and vicinity with the statement that no "positive conclusions can be drawn from our experience with the serum." "We are confident that no harm was done." The judicious employment of gelatine and olive oil makes an important addition to the well-recognized management of the ileocolitis. The serum treatment of typhoid fever has received considerable encouragement from Josias, who reports fifty cases with a mortality of 4 per cent., while during the same period other cases treated in the usual manner gave a mortality of 14.2 per cent. Einhorn recommends early injection, even before diagnosis is certain. In his cases the treatment was instituted from the ninth to the fifteenth day. He notes the reduction of temperature from one to two degrees and the general improvement of the sensory and nervous symptoms. De Rochemont reports his experience with Jezz's serum, and concludes that while wonderful cures can not be

cited, in every case the course was modified and rendered milder, though not shortened.

Pertussis has received its annual allotment of therapeutic agents, all of them of inestimable value in the hands of the originator. Formaldehyde in from one-half to one per cent. solution, sprayed into the pharynx once a day; two per cent. solution of flouroform, given in doses of from 100 to 150 grams daily; and calcium sulphide in .03 gram doses every hour or two until the breath smells of hydrogen sulphide; are among the remedies receiving much support. Manipulation of the lower jaw after the method of Naegeli, will control the paroxysm in most instances in older children. Mothers and attendants should be instructed in this procedure. The control of the laryngismus relieves the usual vomiting and resulting emaciation, and with the supportive measures, good food and fresh air, meets the indications. The fresh air treatment is emphasized in the records of the Edinburgh Hospital.

Dr. Mallory's finding of a series of bodies in the skin and superficial lymph spaces of four patients who died in the eruptive stage of scarlet fever is far from proving the etiological factor of this disease. We do know, however, that the streptococcus is present on the tonsils in almost every case; in the blood in 15 per cent. of the cases during life, and in 80 per cent. after death. The stroptococcus is generally accountable for the severity of the disease, especially the complications and sequelæ, and these complications can be prevented by the early use of an efficient serum administered in sufficiently large doses. From the literature of the past twelve months the writer has collected 384 reported cases, and about double that number mentioned where the antistreptococcus serum has been administered in this disease. The largest number reported by any one observer was 112 cases treated at St. Anna Kinderspital by T. Escherich; and in these the mortality was reduced one-half. The summary of his cases is as follows: Of 38 cases injected on the first and second day all recovered; of 27 cases injected on the third day two died, mortality 7.4 per cent.; of 23 cases injected on the fourth day four died, mortality 17.4 per cent.; of 20 cases injected on the fifth day

six died, mortality 30 per cent.; of four cases injected on the ninth day two died, mortality 50 per cent. Escherich believes the day not far distant when antistreptococcus serum will stand in the same relation to scarlet fever that antidiphtheritic serum does to diphtheria. The summary of the changes noted by the various clinicians can be stated briefly as follows: Fall in temperature, decrease in the frequency of the pulse and respiration, and an improvement in the tension and rhythm of the former, clearing of the sensorium, prevention or amelioration of complications and rapid convalescence. A polyvalent serum, containing the antibodies of human streptococci, is the only one to be depended upon. The serum appears not to destroy but to reduce the virulence of the organism, thus enabling the tissue cells to become more energetic in defense, indirectly favoring phagocytosis and absorption. Early use of the serum is to be recommended in all cases of scarlet fever and in all other diseases where the streptococcus is playing a primary or secondary rôle. A. C. Smith reports use of the serum in a series of smallpox cases with excellent results.

Widowitz reports the use of urotropin in 102 cases of scarlet fever without a single case of nephritis. Seiffert has had some remarkable results from the employment of lumbar puncture in uremia occurring in scarlatinal nephritis. In several cases he withdrew from five to thirty cubic centimeters of spinal fluid.

The therapeutic suggestions and clinical observations of chorea minor have been about as important and conclusive as the pathological and bacteriological findings. We are constantly confronted with individual predispositions in children, born of neurotic stock, that are influenced by the slightest degree of nerve pressure, whether it be of school, adolescence or reflexes; and an infection or intoxication that would pass unnoticed in well-balanced nervous systems, would in these produce chorea or many other nervous phenomena. The association of chorea and rheumatism can be demonstrated in the majority of cases, if kept under observation sufficiently long. Micro-organisms of the streptococcal group have been found in both of these disorders, and may possibly have had

something to do with the individual cases examined, but we have no proof of their constancy or their specific character. Inasmuch as we find chorea complicating pronounced anemia and infectious diseases, not associated with rheumatism, we are led to believe that many organisms and ptomains are capable of producing these same muscular spasms. Where there is any indication of rheumatism in these cases, treatment should be begun with sodium salicylate from .2 to 1 gram dissolved in a glass of water and taken two hours after meals. Smith uses 4 c.c. doses of the fluid extract of ergot every three or four hours, in children of seven years, and continues the treatment for weeks if necessary. In stubborn cases he increases the dose to 6 c.c. and adds a moderate dose of strychnine. He regards this treatment as more reliable than the arsenic treatment, but the report of only two cases does not justify the conclusion.

In the management of pulmonary disorders there is nothing so important as fresh air, sunshine and isolation. As 50 per cent. of the pneumoniæ are due to bad air, more than half of these secondary inflammations should be avoided. Many of these cases do well on the cold air treatment, but infants and young children must have their air at 68 degrees F. to prevent the irritating cough. The early respiratory disturbances, with dryness and congestion, are benefited by inhalations of steam carrying eucalyptus, creosote, tinct. benzoin comp. and aromatics. If these inhalations are given under a tent and there is a lack of fresh air, oxygen may be administered simultaneously. These cases must be supported, but not overfed, by a suitable amount of easily digested or predigested food, with an abundance of water. As long as the fever is doing no damage and the child is comfortable, it should be let alone. Cold applications can usually be limited to the head. The tepid sponge bath and hot mustard foot bath are excellent measures for equalizing the circulation. The use of poultices, packs and jackets is dying out. Mild stimulating applications, as that suggested by Acker of equal parts of the oils of olive, amber and clove, are more pleasant and efficacious, and have none of the objectionable features. The potassium iodide treatment

of pneumonia is lauded by Altschul, who claims not to have had a death in twelve years, out of 62 cases. His method is to give an initial dose of 10 or 15 grains, increasing it by 5 to 10 grains, every two or three hours day and night, according to the severity of the case, until defervescence is well established.

In cerebrospinal meningitis lumbar puncture, withdrawal of fluid by aspiration, and injection of 3 to 12 c.c. of a 1 per cent. solution of lysol, after the method of Seager, omitting the canal washing with normal salt solution, has proved of great virtue in three cases reported by Manger, and is considered a hopeful measure by Franca.

RECENT ADVANCES IN LARYNGOLOGY AND RHINOLOGY.

Dr. C. H. Knight, New York, read the report on this Branch. It opened with a reference to two of the modern operations for deviated septum, that of Moure, of Bordeaux, and the so-called "window-resection" operation of Krieg. The latter is meeting with special favor in this country. In it all the obstructing hard parts of the nasal septum are resected, leaving the mucous membrane. Thus the caliber of the nares is restored and the function of the membranes is preserved. The septum is looked upon merely as a partition and in no degree as a support to the external nose, so that no effect upon the contour of the latter follows. The operation is done under local anesthesia and requires a pretty long sitting, hence it is a good deal of a tax upon the fortitude and patience of both subject and operator. Barring an occasional perforation from "buttonholing" the mucosa, which seems to be an accident of but little moment, the results are highly satisfactory, and the operation is adapted to every variety of deviation in which a simpler procedure may not be available.

The subjects of asthma and hay fever were reviewed, especial attention being given to the extaordinary claims of Alexander Francis in the former, and the use of the antitoxin of W. R. Dunbar in the latter. It may be said that the hay fever serum is still on trial and reports up to date are encouraging.

As to the Francis cure of asthma by searing the septical cartilage opposite the middle turbinate with the electric cautery, it would seem incredible that so complex a disease should yield to such a simple procedure. The record of an astonishing proportion of rapid cures seems to be made in good faith, but Dr. Knight is inclined to await a confirmation of the results in the hands of others.

The post-operative management of nasal surgical cases, as discussed at a meeting of the London Laryngological Society and in a paper by G. Krebs, of Hildesheim, is a most important and much neglected subject. The tendency of the time is toward more conservatism in nasal surgery, less elaborate dressings and much less tinkering with the parts during convalescence. It is believed that the comfort of the patient and the kindly healing of the wound are thus better subserved. The weight of opinion is in favor of local anesthesia in nasal surgery. Views as to secondary hemorrhage after the use of adrenalin are divided. On the whole, most observers agree that bleeding is little if at all more frequent than it was before the days of adrenalin. At any rate, its advantages in operating are so pronounced that the question becomes merely one of taking extra precaution to prevent the exciting causes.

Brief reference was made to the surgery of the sinuses and it was noted that many still hold the opinion "that our patients are just as well off in the long run if given free drainage to pus as they are after attempts at radical cure." Jansen's method of reaching the sphenoid by way of the maxillary sinus is to be adopted in cases of multiple sinusitis or when nasal stenosis prohibits free access. It is called for very rarely.

The paper closed with a review of the present methods of dealing with cancer of the larynx. Endo-laryngeal operation should be reserved for the most incipient and circumscribed lesions. The brilliant results with complete laryngectomy obtained by Gluck are likely to revive interest in that operation, yet the extensive mutilation involved and the after-condition of the patient will always raise the question in many minds as to whether it is ever justifiable. There is no doubt that a thyrotomy, in suitable cases of intrinsic disease, in

which the prognosis is decidedly more favorable, gives at least equally good results and leaves the patient in a far more comfortable state. In extrinsic disease "it seems most reasonable and humane to leave the decision as to attempts at complete extirpation to the patient himself, after a full explanation of the risks and probabilities."

RECENT ADVANCES IN PHYSIOLOGICAL THERAPEUTICS.

DR. S. S. COHEN, Philadelphia, made an extemporaneous address on this subject.

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